The Transit Center would be incorporated into the ground floor of the two-level, 414-space parking garage that would be located on the south side of the City Hall. The Transit Center would provide four bus stalls and a waiting area for passengers. The maximum height of the Transit Center would be approximately 28 feet above grade.

Building Massing

The proposed project would result in the development of several multi-story buildings in excess of 80 feet on approximately 44 acres (includes roadways and in the Bishop Ranch Business Park. Three structures developed in Bishop Ranch 1A would be in excess of 100 feet above finished grade. Exhibit 4.1-6 provides a perspective of the proposed project's building massing.

Floor Area Ratio (FAR) provides a measurement of building massing and is calculated by divided project square footage (2,168,466) by the square feet of developable land area (1,702,760). The entire City Center project would have a 1.27 FAR, which is within the maximum allowable 1.35 FAR established in the Zoning Ordinance for the City Center Mixed Use (CCMU) zone.

Building massing is evaluated by project component below.

Plaza District

As shown in the exhibit, the Plaza District structures would introduce new building masses to Parcels 2 and 3A. Multi-story structures would occupy each of the seven Plaza District blocks and range in height from approximately 35 feet to 91 feet. Nearly all of the blocks would have solid massing from finished grade to approximately 40 feet above finished grade, with smaller features such as towers extending further upward. Some blocks would have solid massing to heights of 70 feet above finished grade. Generally, most blocks would have solid massing between approximately 40 and 62 feet above finished grade.

Bishop Ranch 1A

Bishop Ranch 1A would have the most prominent building massing of any of the proposed project's components. Solid massing would extend to approximately 110 feet above finished grade for all three office buildings. Both the Bishop Ranch 1A and Bishop Ranch 1 parking structures would have solid massing extending to approximately 42 feet above finished grade.

City Hall and Transit Center

The City Hall would have solid building massing extending to approximately 61 feet above finished grade. The Transit Center would have solid building massing extending to approximately 28 feet above finished grade.

Shade and Shadow

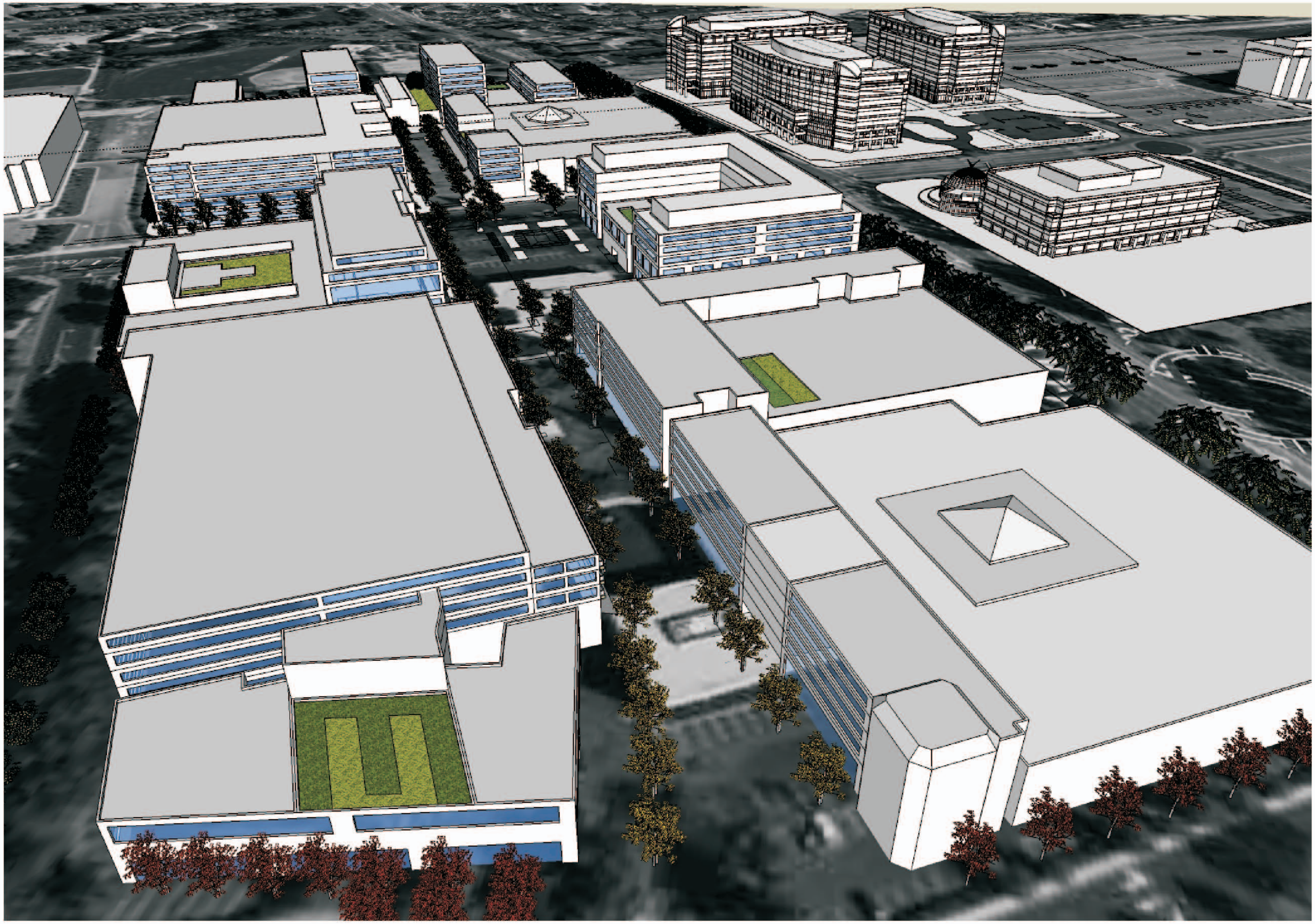
Exhibits 4.1-7a through 4.1-7d provide simulations of the proposed project's shade and shadow during the summer and winter solstices. Because it is located east of the project site, the Iron Horse Trail would not receive any shadow from the proposed project's structures during the morning hours at any time during the year, or during the early afternoon hours in the spring and summer months. During the early afternoon hours in the fall and winter months, Plaza District Blocks F and G and Bishop Ranch 1A structures would cast shadows onto the trail. As shown in Exhibit 4.1-7d, shadow from Plaza District Blocks F and G and Bishop Ranch 1A would extend onto the Iron Horse Trail at 2 p.m. on the Winter Solstice, which is the worst-case scenario for early afternoon shadow impacts.

General Plan Policy 4.8-I-17 requires that "large-scale office development" provide sun access planes adjacent to public parks (which includes Central Park) at a ratio of at least 3.5 feet of horizontal distance per 1 foot of building height above finished grade. General Plan Figures 4-5, 4-6, and 4-7 depict sun access plan requirements for structures near public parks, including Central Park. At 3 p.m. on the Winter Solstice, the sun's angle would be approximately 15.5°, azimuth W 42°. Using a building height of 86 feet, the structures on Blocks F and G would need to be set back a minimum distance of 155 feet from the Central Park boundary. As currently shown on the project plans, the structures on Blocks F and G would be set back 172 feet from the park and, therefore, would be consistent with the sun access plane requirement of the General Plan.

Summary of Impacts

The proposed project would irreversibly change the visual character of the project site. Existing buildings and infrastructure, as well as landscaping, would be removed, and a number of new, multi-story structures would be developed on all four parcels. Currently, the tallest buildings in the City are the Bishop Ranch 8 office structures, which stand approximately 87 feet above grade. Five City Center buildings would exceed 87 feet above grade: the residential structure on Blocks F and G at approximately 89 feet, the hotel at approximately 91 feet, and the three Bishop Ranch 1A office structures at approximately 110 feet. The General Plan explicitly exempts City Center buildings from height restrictions, and the total project FAR is 1.27, within the FAR of 1.35 established by the Zoning Ordinance. In addition, the proposed project's structures would be consistent with the sun access plane requirements of the General Plan. Therefore, it is reasonable to conclude the height, massing, and shade and shadow effects of the proposed project's structures are consistent with the visual character envisioned by the City's land use policy documents.

More broadly, the General Plan envisions the City Center as a cultural, entertainment, and commercial destination for local residents, and the policy language recognizes the need for providing design requirement flexibility for the project. Significant flexibility is given to building height, FAR, and intensity of uses, indicating that City decision makers and the San Ramon electorate who approved the General Plan in March 2002 were aware that the City Center project would be unique in its nature, scope, and scale. For this reason, it is reasonable to conclude that, while the City Center would dramatically and irreversibly alter the visual character of the project site and the surrounding area, the General Plan—and by extension City decision makers and the San Ramon electorate—have identified this change as City policy. Therefore, the proposed project's aesthetic characteristics would be consistent with established City policy and the long-term vision of the community visual character.



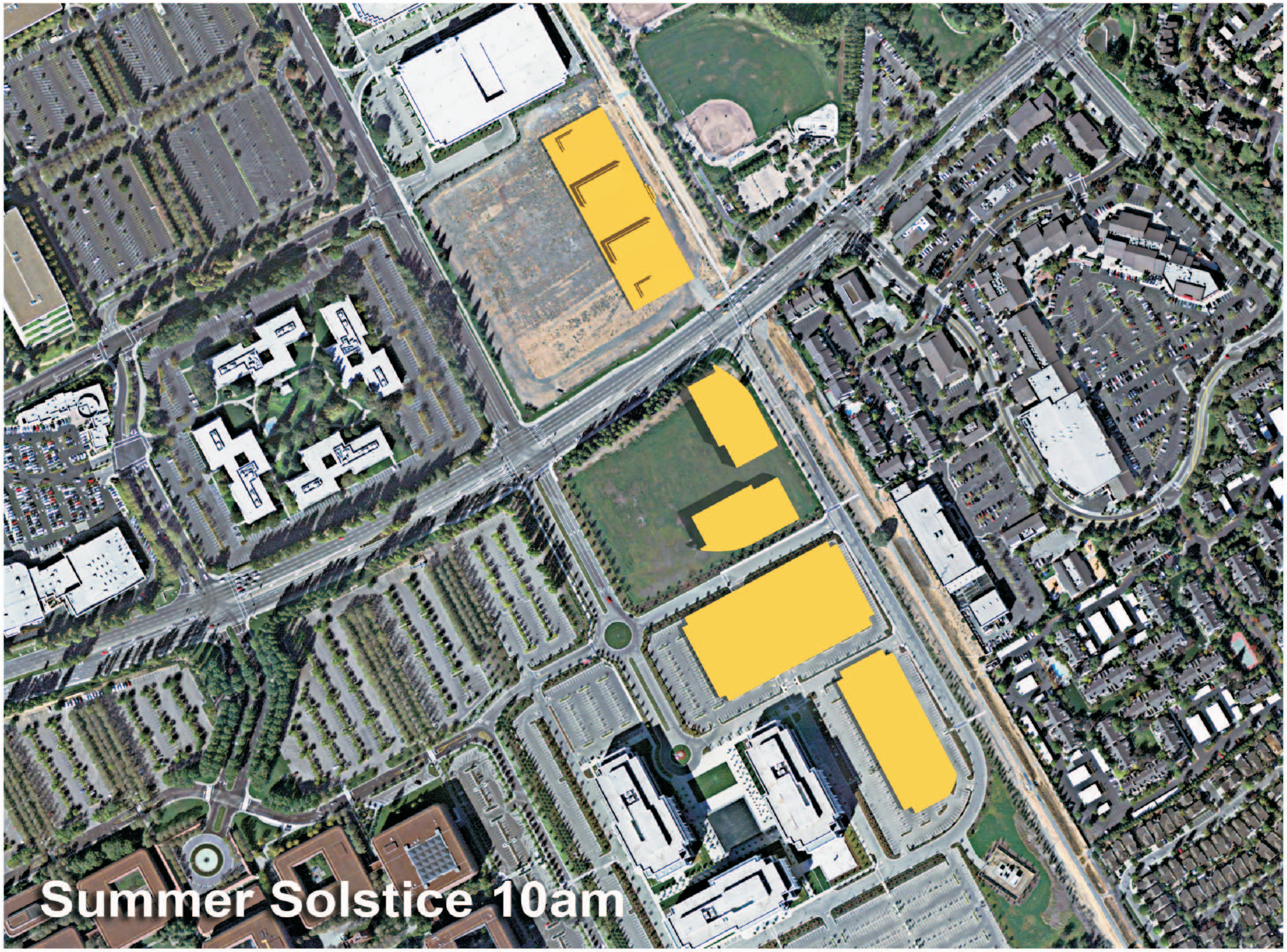
Source:

Michael Brandman Associates

24910007 • 06/2007 | 4.1-6_project_perspective.cdr

Exhibit 4.1-6
Project Perspective

CITY OF SAN RAMON • SAN RAMON CITY CENTER PROJECT
DRAFT SUBSEQUENT ENVIRONMENTAL IMPACT REPORT

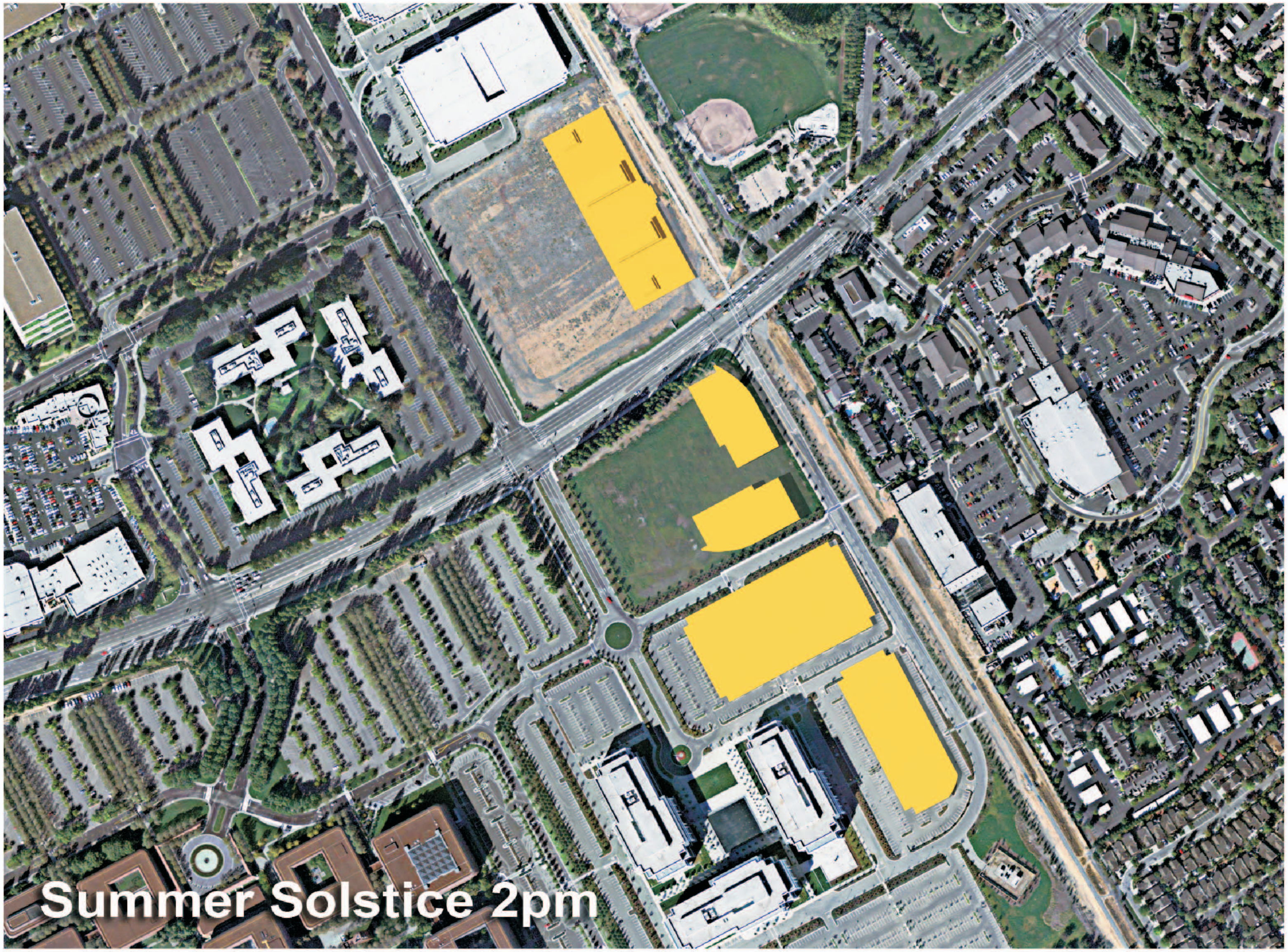


Source:

Michael Brandman Associates

24910007 • 06/2007 | 4.1-7a_summer_sols10am.cdr

Exhibit 4.1-7a
Shade and Shadow - Summer Solstice 10 a.m.



Source:

Michael Brandman Associates

24910007 • 06/2007 | 4.1-7b_summer_sols2pm.cdr

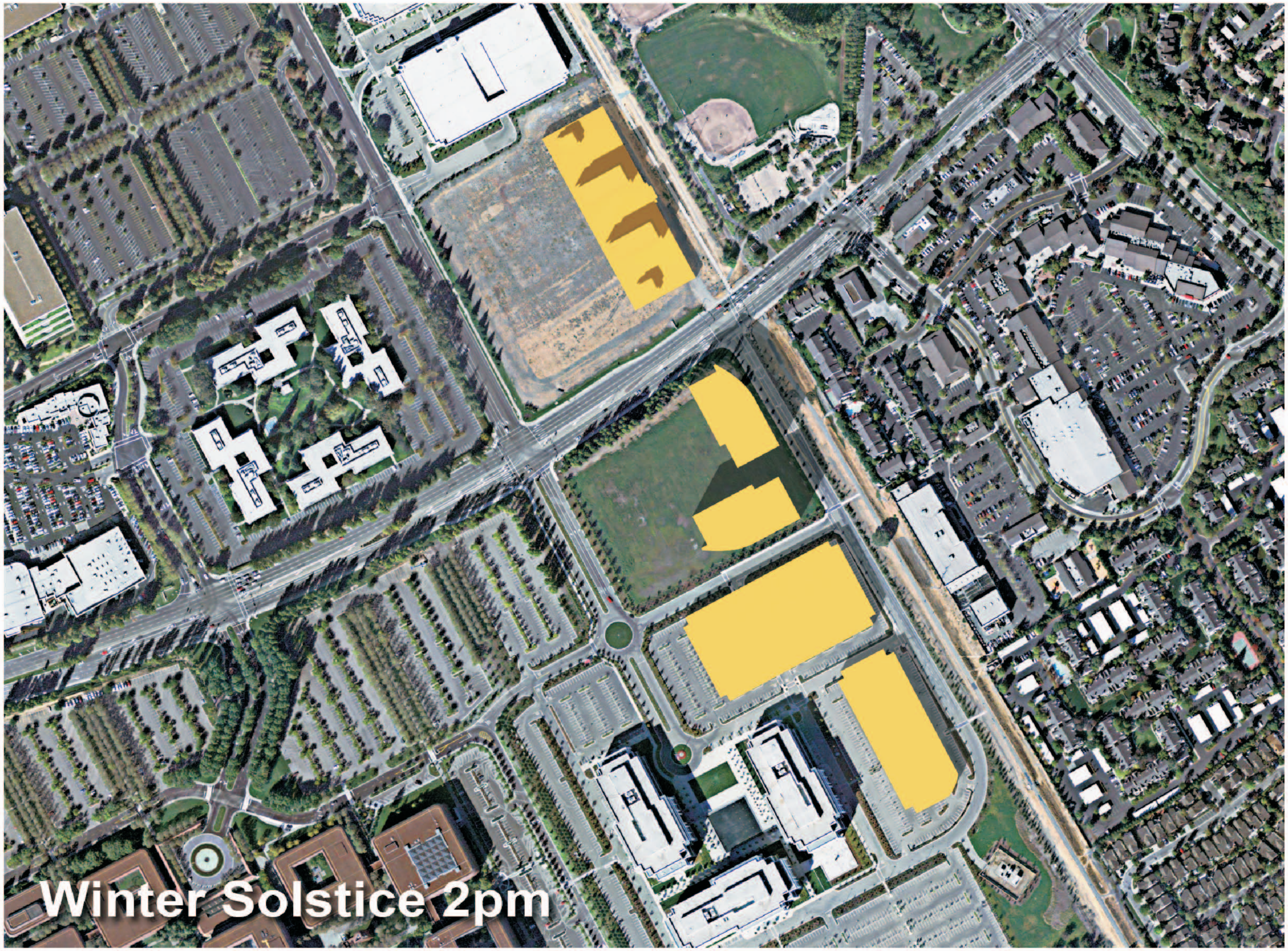
Exhibit 4.1-7b
Shade and Shadow - Summer Solstice 2 p.m.

Source:

Michael Brandman Associates

24910007 • 06/2007 | 4.1-7c_winter_sols10am.cdr

Exhibit 4.1-7c
Shade and Shadow - Winter Solstice 10 a.m.



Source:

Michael Brandman Associates

24910007 • 06/2007 | 4.1-7d_winter_sols2pm.cdr

Exhibit 4.1-7d
Shade and Shadow - Winter Solstice 2 p.m.

Impacts on visual character would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Light and Glare

Impact AES-4: The proposed project would create new sources of substantial light or glare that may adversely affect day or nighttime views.

Impact Analysis

The proposed project would develop and redevelop a total of approximately 2.1 million square feet of mixed uses (approximately 1.6 million net square feet above existing vested entitlement and approximately 1.9 million square feet of net additional construction above existing site conditions). All of the proposed project's commercial, residential, and civic structures would be multi-storied, have large glass windows, and would be equipped with exterior lighting. This impact assesses the proposed project's light and glare impacts. Each topic is discussed separately.

Light

New sources of light would be emitted from exterior building lighting, street lighting, parking structure lighting, illuminated signs, and vehicular headlights. Lighting associated with each project component is discussed below.

Plaza District

The Plaza District is intended to be a vibrant cultural, entertainment, and retail destination that would operate from the morning through the late evening. Reflecting the expected duration and intensity of use, the Plaza District would be well lit with exterior lighting along streets and buildings and in parking structures to provide for a safe and secure environment. Decorative lighting and illuminated signs would be located along roadways and pedestrian areas. Interior lighting would also be visible, particularly on the upper floors.

Parcel 2 currently contains Bishop Ranch 2, which emits existing sources of light from exterior building lighting and parking lot lighting. However, the Plaza District would have more intensive uses than Bishop Ranch 2 and, therefore, would result in a substantial increase in illumination onsite. Potential receivers of light spillage include The Shops at Bishop Ranch, the AT&T campus, Bishop Ranch 3, the Iron Horse Trail, and Central Park. Mitigation is proposed that would require the project applicant to submit a photometric plan to the City, identifying measures to shield lighting and prevent spillage onto neighboring land uses.

Bishop Ranch 1A

Bishop Ranch 1A would contain three seven-story office structures similar in nature to the nearby Bishop Ranch 1 office structures. Exterior lighting would be located around the building, along pathways and roadways, and in the two parking structures. This lighting would be similar to exterior lighting currently located around the Bishop Ranch 1 structures. Nonetheless, the mitigation measure would apply to this component.

A photometric plan for Bishop Ranch 1A, City Hall, and the Transit Center is provided in Exhibit 4.1-8.

City Hall and Transit Center

City Hall would consist of a four-story structure, and the Transit Center would be located in a two-story parking structure. The City Hall would be similar in nature to Bishop Ranch 1A but substantially smaller. Exterior lighting associated with City Hall would be located around the building, along pathways and roadways, and in the Transit Center parking structure. Similar to Bishop Ranch 1A, exterior lighting associated with City Hall would be similar to the existing lighting associated with Bishop Ranch 1. Nonetheless, the mitigation measure would apply to this component.

Glare

Consistent with the appearance of the other multi-story structures in the Bishop Ranch Business Park, all of the proposed project's prominent multi-story structures would have large glass windows that have the potential for glare. However, glare from existing structures in the Bishop Ranch Business Park (e.g., Bishop Ranch 1 and Bishop Ranch 3) is not noticeable on even the brightest days because the exterior glass is treated to reduce reflection. The proposed project's commercial, residential, and civic structures would employ the use of similarly treated glass, and it is expected that glare from glass windows would not be substantial enough to adversely affect views.

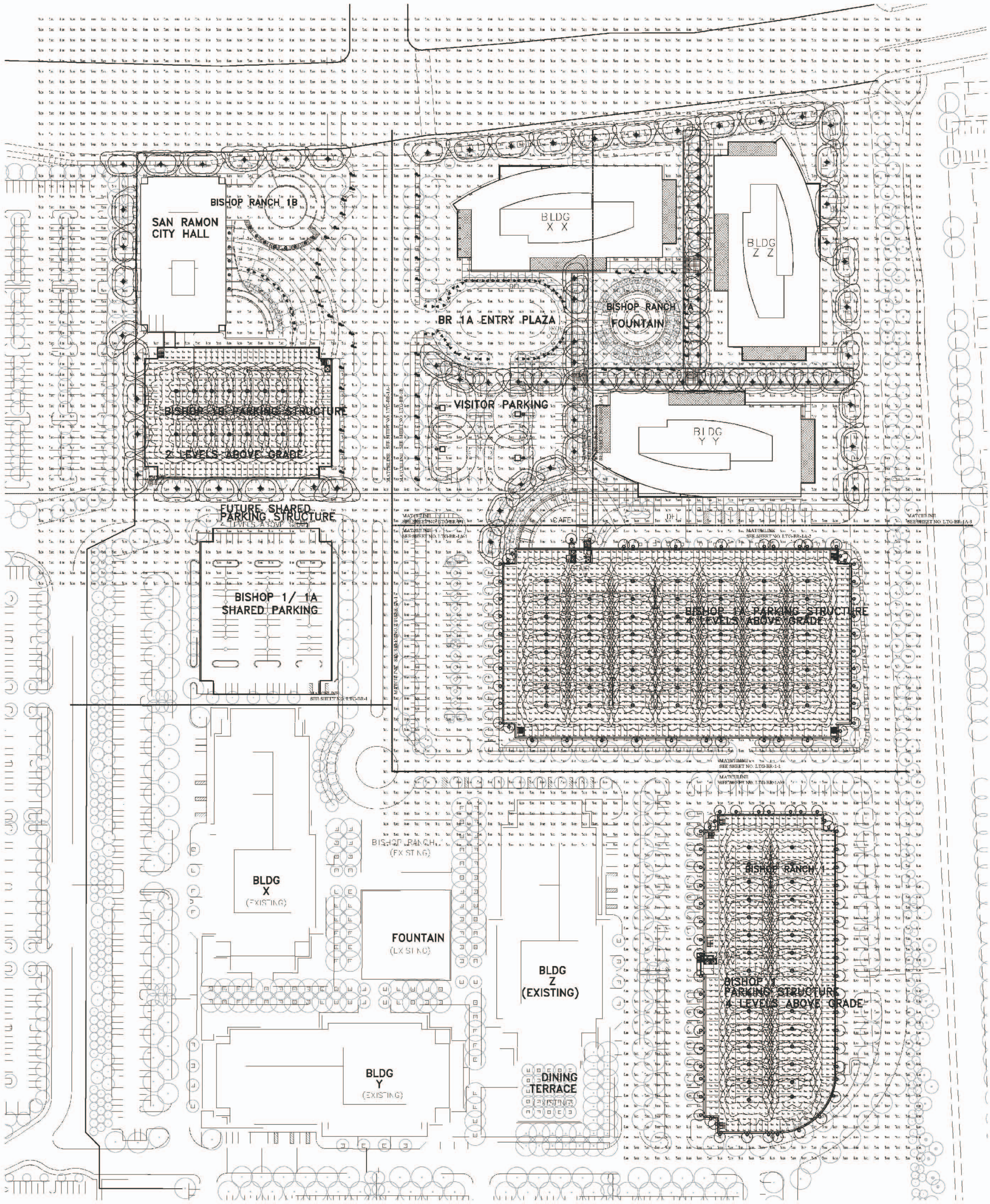
Summary of Impacts

Because of the scale and intensity of the proposed project, lighting impacts associated with the project have the potential to be significant, and mitigation is proposed that would require the applicant to submit a lighting plan identifying light shielding techniques to minimize unwanted spillage to the extent feasible. With the implementation of mitigation, potentially significant impacts associated with unwanted light spillage onto neighboring land uses would be reduced to a level of less than significant.

The proposed project is not expected to have substantial glare impacts because of the limited potential for noticeable glare from glass windows.

Level of Significance Before Mitigation

Potentially significant impact.



LIGHTING SYMBOLS LEGEND

LIGHTING SYMBOLS	DESCRIPTION	LOCATION
●	BOLLARD LIGHTING GARDCO BRM824-42"-42TRF; OR EQUAL	PEDESTRIAN WALKWAY
⊕	PEDESTRIAN 12 FT. POLE LIGHT (@ 60' O.C.) FIXTURE: GARDCO #CP1713-100MH; OR EQUAL POLE: GARDCO #PRA4-12'-AF; OR EQUAL	PEDESTRIAN WALKWAY
▽	12" ø, FLUSH-IN GROUND UPLIGHT AT TREES HADCO #14-G-SS-FL-70H-H; OR EQUAL	BR ENTRY PLAZA
□	GARDCO "SHOEBOX" FIXTURE GARDCO #H19-1-FM-400MH-480-BRP 400 METAL HALIDE LAMP FIXTURE ON 30 FT TALL ROUND TAPERED POLE; OR EQUAL	BR-1B PARKING LOT
○	DOWNLIGHT IN CANOPY ZUMTOBEL #S5D 7204-S2-7202R-MC; OR EQUAL	CITY HALL BLDG. CANOPY
♀	COMPACT FLUORESCENT WALL SCONCE AT GARAGE EXTERIOR WALLS, MTD. AT +12' A.F.F. VISA LIGHTING #OW1312-1F40; OR EQUAL	GARAGE BLDGS.
⊙	HARDTOP ROUND POST TOP FIXTURE GARDCO #CP17IQ-250MH-277-SC ON 17'-6" TALL POLE; OR EQUAL	ROOF/GARAGE BLDGS.

Source: Rosendin Electric Lighting Design, April 2007.

Michael Brandman Associates

NORTH

126 63 0 126
Feet

Exhibit 4.1-8
Photometric Plan

Mitigation Measures

MM AES-4 Prior to issuance of building permits, the applicant shall submit a site lighting plan to City of San Ramon for review and approval. The plan shall identify necessary requirements established in the Zoning Ordinance (D3-7 and D3-33) and must provide detailed information regarding lighting levels by the use of photometrics to indicate the maximum, minimum, and average footcandle lighting level proposed for this project. The plan shall also identify the type of light fixtures and pole height.

Level of Significance After Mitigation

Less than significant impact.

4.2 - Air Quality

4.2.1 - Introduction

This section describes the existing air quality setting and potential effects from project implementation on the site and its surrounding area. Descriptions and analysis in this section are based on information contained in the San Ramon City Center Air Quality Analysis Report, prepared in June 2007 by Michael Brandman Associates, included in this EIR as Appendix B.

As explained in Section 1, Introduction, where applicable, this project-level Draft Subsequent Environmental Impact Report (DSEIR) tiers off and incorporates by reference information and analysis contained in the City of San Ramon General Plan EIR and the San Ramon City Civic Center EIR, certified by the San Ramon City Council in 2001 and 2003, respectively. The General Plan EIR contemplated buildout of the General Plan at a programmatic level and concluded that it would have a significant unavoidable impact on air quality because planned growth would exceed the projections contained in the Bay Area Air Quality Management District Clean Air Plan in Section 4.7 of the document. The City Council adopted a Statement of Overriding Considerations for the significant unavoidable impact. All other air quality impacts were found to be less than significant after the implementation of mitigation. The City Civic Center EIR provided project-level analysis of the smaller and less intense City Civic Center project and concluded that all air quality impacts were less than significant after mitigation in Section 4.3 of the document. This DSEIR also incorporates by reference the City of San Ramon Zoning Ordinance Final Negative Declaration and the Addendum to the City of San Ramon Zoning Ordinance Final Negative Declaration, both of which were certified by the San Ramon City Council in 2006.

This DSIER accounts for modifications to the baseline conditions that have occurred since certification of the previous EIRs and changes that have increased the size and intensity of the proposed project. Accordingly, not all of the conclusions in the previous EIRs are applicable to the proposed project, and new analysis is provided for potential impacts not previously considered in those documents.

4.2.2 - Environmental Setting

San Francisco Bay Area Air Basin

San Ramon is located within the San Francisco Bay Area Air Basin, which comprises all or portions of the nine Bay Area counties. Air quality in the Air Basin is regulated by the United States Environmental Protection Agency (EPA), the California Air Resources Board (CARB), and the Bay Area Air Quality Management District (BAAQMD). The regulatory responsibilities of these agencies are discussed in the Regulatory Framework section.

Regional and local air quality is impacted by dominant airflows, topography, atmospheric inversions, location, season, and time of day. These characteristics are discussed in relation to the Air Basin.

Large Scale Influences

A semi-permanent, high-pressure area centered over the northeastern Pacific Ocean dominates the summer climate of the West Coast. Because this high-pressure cell is quite persistent, storms rarely affect the California coast during the summer. Thus, the conditions that persist along the coast of California during summer are a northwest airflow and negligible precipitation. A thermal low-pressure area from the Sonoran-Mojave Desert also causes air to flow onshore over the San Francisco Bay Area much of the summer.

The steady northwesterly flow around the eastern edge of the Pacific high-pressure cell exerts stress on the ocean surface along the west coast. This induces upwelling of cold water from below. Upwelling produces a band of cold water off San Francisco that is approximately 80 miles wide. During July, the surface waters off San Francisco are 3 degrees Fahrenheit (°F) cooler than those off Vancouver, British Columbia, more than 900 miles to the north. Air approaching the California coast, already cool and moisture-laden from its long trajectory over the Pacific, is further cooled as it flows across this cold bank of water near the coast, thus accentuating the temperature contrast across the coastline. This cooling is often sufficient to produce condensation—a high incidence of fog and stratus clouds along the Northern California coast in summer.

In winter, the Pacific High weakens and shifts southward, upwelling ceases, and winter storms become frequent. Almost all of the Bay Area's annual precipitation takes place in the November through April period. During the winter rainy periods, inversions are weak or nonexistent, winds are often moderate, and air pollution potential is very low. During some periods in winter, when the Pacific high becomes dominant, inversions become strong and often are surface-based; winds are light, and pollution potential is high. These periods are characterized by winds that flow out of the Central Valley into the Bay Area.

Topography

The San Francisco Bay Area is characterized by complex terrain consisting of coastal mountain ranges, inland valleys, and bays. Elevations of 1,500 feet are common in the higher terrain of this area. Normal wind flow over the area is distorted in the lowest levels. This is particularly true when the air mass is stable and the wind velocity is not strong. With stronger winds and unstable air masses moving over the area, this distortion is reduced. The distortion is greatest when low-level inversions are present, with the surface air beneath the inversion flowing independently of the air above the inversion. This latter condition is very common in the summer, the surface air mass being the sea breeze.

Winds

In summer, the northwest winds to the west of the Pacific coastline are drawn into the interior through the Golden Gate and over the lower portions of the San Francisco Peninsula. Immediately to the south of Mount Tamalpais, the northwesterly winds accelerate considerably and come more nearly from the west as they stream through the Golden Gate. This channeling of the flow through the

Golden Gate produces a jet that sweeps eastward but widens downstream, producing southwest winds at Berkeley and northwest winds at San Jose; a branch curves eastward through the Carquinez Straits and into the Central Valley. Wind speeds may be locally strong in regions where air is channeled through a narrow opening such as the Carquinez Strait, the Golden Gate, or San Bruno Gap. For example, the average wind speed at San Francisco International Airport from 3 a.m. to 4 p.m. in July is about 20 miles per hour (mph), compared with only about 8 mph at San Jose and less than 7 mph at the Farallon Islands.

The sea breeze between the coast and the Central Valley commences near the surface along the coast in late morning or early afternoon; it may first be observed only through the Golden Gate. Later in the day, the layer deepens and intensifies while spreading inland. As the breeze intensifies and deepens, it flows over the lower hills farther south along the peninsula. This process frequently can be observed as a bank of stratus clouds "rolling over" the coastal hills on the west side of the bay. The depth of the sea breeze depends in large part upon the height and strength of the inversion. The generally low elevation of this stable layer of air prevents marine air from flowing over the coastal hills. It is unusual for the summer sea breeze to flow over terrain exceeding 2,000 feet in elevation.

In winter, the Bay Area experiences periods of storminess, moderate-to-strong winds, and periods of stagnation with very light winds. Winter stagnation episodes are characterized by outflow from the Central Valley, nighttime drainage flows in coastal valleys, weak onshore flows in the afternoon, and otherwise light and variable winds.

Temperature

In summer, the distribution of temperature near the surface over the Bay Area is determined in large part by the effect of differential heating between land and water surfaces. This process produces a large-scale gradient between the coast and the Central Valley, as well as small-scale, local gradients along the shorelines of the ocean and bays. The temperature contrast between coastal ocean water and land surfaces 15 to 20 miles inland reaches 35°F or more on many summer afternoons. At night, this contrast usually decreases to less than 10°F.

The winter mean temperature maxima and minima reverse the summer relationship in that daytime variations are small while mean minimum (nighttime) temperatures show large differences and strong gradients. The moderating effect of the ocean influences warmer minimums along the coast and penetrating the Bay. Coldest temperatures are in the sheltered valleys, implying strong radiation inversions and very limited vertical diffusion. An anomaly of warmer temperatures in the Santa Clara Valley is clearly an urban "heat island" effect, most pronounced on winter nights. Such heat islands are proportional to structure density and also appear over San Francisco and Oakland.

Inversions

A primary factor in air quality is the mixing depth (i.e., the vertical dimension available for dilution of contaminant sources near the ground). Over the Bay Area, the frequent occurrence of temperature inversions limits mixing depth and, consequently, limits the availability of air for dilution. A temperature inversion may be described as a layer of warmer air over cooler air.

On most days, higher altitudes mean lower air temperatures. This is caused by most of the sun's energy being converted to sensible heat at the ground, which, in turn, warms the air at the surface. The warm air rises in the atmosphere, where it expands and cools. Sometimes, however, the temperature of air actually increases with height. This condition is known as temperature inversion, because the temperature profile of the atmosphere is "inverted" from its usual state. There are two major types of temperature inversion: "surface inversions," which occur near the Earth's surface, and "aloft inversions," which occur higher above the ground than surface inversions. Surface inversions are most important in the study of air quality.

For the most part, surface inversion patterns correlate with seasonality. The strong inversions typical of summer are formed by subsidence, the heating of downward-moving air in the high-pressure anticyclone over the western Pacific. The surface inversions typical of winter are formed by radiation as air is cooled in contact with the earth's cold surface at night. While these seasonal correlations are most prevalent, both inversion mechanisms may operate at any time of the year. At times, surface inversions formed by radiational cooling may reinforce the subsidence inversion aloft, particularly in fall and winter. The thick, strong inversion resulting in this case is especially effective in trapping pollutants.

The vertical temperature structure over the Bay Area is taken by the National Weather Service (NWS) twice daily, at 4 a.m. and 4 p.m., at Oakland International Airport. NWS reports that the inversion types found vary widely in seasonal patterns and over a 24-hour period. Localized inversion variations resulting from the numerous terrain types within the Bay Area have also been observed.

In the morning, the seasonal variations are most dramatic. From June through September there are only two days per year, on average, with no inversion below 5,000 feet. March and April have fewer morning inversions. The occurrence of surface inversions is highest from October through January, when the characteristic radiation inversion predominates. A wide cluster of occurrences between 500 to 2,500 feet dominates from May through September, when the summer subsidence inversion over the marine layer dominates. There is substantial day-to-day variability in the depth of the marine layer.

The afternoon data shows two striking and significant differences from the morning data. First, the frequent disappearance of the surface radiation inversion dominates the winter nights. During these months, a surface inversion observed in the morning persists through the afternoon less than 20 percent of the time. However, a corresponding afternoon increase may be noted in the cases from 500 to 2,500 feet. Thus, the inversion is frequently raised and perhaps weakened, but not destroyed. Second, the afternoon lowering of the marine inversion dominates the summer months. In July and

August, the afternoon inversions are frequently in the 500- to 1,000-foot interval, compared with the 1,000- to 1,500-foot interval in the morning.

Precipitation

Moderately wet winters and dry summers characterize the San Francisco Bay Area climate. Winter rains (December through March) account for about 75 percent of the average annual rainfall; about 90 percent of the annual total rainfall is received in the November-April period; and between June15 and September 22, normal rainfall is typically less than 0.1 inch.

Annual precipitation amounts show great differences in short distances. Annual totals exceed 40 inches in the mountains and less than 15 inches in the sheltered or "shadowed" valleys. The frequency of winter rain is more uniform, however, with 10 days per month (December through March) being typical.

During rainy periods, ventilation and vertical mixing are usually high, and, consequently, pollution levels are low. However, there are frequent winter dry periods lasting over a week. It is during some of these periods that carbon monoxide and particulate pollution episodes develop.

Climate in the Diablo and San Ramon Valleys

In the Bay Area, the California Coast Range splits into a western and eastern range, with the San Francisco Bay between the two ranges. East of the eastern Coast Range lies the Diablo and San Ramon valleys, which trend from northwest to southeast. The northern portion is known as Diablo Valley and the southern portion as San Ramon Valley. The east side of the valleys is bordered by the Black Diamond Hills and Mount Diablo.

The Diablo Valley is a broad valley, approximately 5 miles wide and 10 miles long. The Carquinez Strait is at its north end; in the south, it tapers into the San Ramon Valley. Cities in the Diablo Valley include Concord and Walnut Creek. Martinez at the north end is better characterized by the Carquinez Strait region.

San Ramon Valley continues south from the Diablo Valley, extending from Alamo to Dublin. The valley is long and narrow, approximately 12 miles long and 1 mile wide. At its southern end, it opens to the Amador Valley. San Ramon and Danville are the largest communities in the San Ramon Valley.

The Coast Range on the west side of these valleys is 1,500 to 2,000 feet high. This is sufficiently high to block much of the marine air from reaching the valleys. During the daytime, there are two, weakly, predominant flow patterns: up-valley flow and westerly flow across the lower elevations of the Coast Range. On clear nights, a surface inversion sets up and separates the surface flow from the upper layer flow. When this happens, the terrain channels the flow down-valley toward the Carquinez Straits. This down-valley drainage pattern can be observed all the way to Martinez at the end of the valley.

Wind speeds in these valleys rank as some of the lowest in the Bay Area. Average annual wind speeds are 4.7 mph in Concord in the Diablo Valley and 5 mph in Danville in the San Ramon Valley. However, winds can pick up in the afternoon in San Ramon because of airflow through the Crow Canyon gap. Through this gap, air pollution from areas to the west is able to travel into the San Ramon Valley during the summer months.

Air temperatures are cooler in the winter and warmer in the summer because these valleys are further from the moderating effect of large water bodies, and because the Coast Range blocks marine air flow. In the Diablo Valley during the winter, Concord records daily maximum temperatures in the mid-50s. During the summer, average daily maximum temperatures are in the high 80s to 90 °F. Average minimum temperatures in winter are in the low to mid-40s. Temperatures in the San Ramon Valley would be similar to temperatures in Concord.

These valleys rarely experience fog during the summer. In the winter, however, tule fogs are common at night. This phenomenon is named after the tule grass wetlands (*tulares*) of the Central Valley. Tule fogs form on cold, clear nights when winds are light and there is abundant moisture on the ground, as happens after a rainstorm. Alternatively, the tule fog can be advected from the Central Valley through the Carquinez Strait and Livermore Valleys. These fogs usually burn off during the day, but occasionally can last for a week or two before being dissipated by the next storm.

Shielded by the Coast Range to the west, rainfall amounts in the Diablo Valley are relatively low. For example, Martinez in the north reports an annual average of 18.5 inches, while Walnut Creek reports 19 inches. Rainfall in the San Ramon Valley is expected to be similar because of the similar orientation of the terrain.

Pollutants

Pollutants are generally classified as either criteria pollutants or non-criteria pollutants. Federal ambient air quality standards have been established for criteria pollutants, whereas no ambient standards have been established for non-criteria pollutants. For some criteria pollutants, separate standards have been set for different periods. Most standards have been set to protect public health. For some pollutants, standards have been based on other values (such as protection of crops, protection of materials, or avoidance of nuisance conditions). A summary of federal and State ambient air quality standards is provided in the Regulatory Framework section.

For reasons described below, the criteria pollutants of greatest concern for the proposed project are ozone (O_3), inhalable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), and carbon monoxide (CO). Other pollutants of concern are toxic air contaminants and asbestos.

Ozone

Ozone is not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. Ozone precursors, which include reactive organic gases (ROG) and oxides of nitrogen

(NO_x), react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem, and often the effects of the emitted ROG and NO_x is felt a distance downwind of the emission sources. Ozone is subsequently considered a regional pollutant. Ground-level ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials.

Ozone can irritate lung airways and cause inflammation much like a sunburn. Other symptoms include wheezing, coughing, pain when taking a deep breath, and breathing difficulties during exercise or outdoor activities. People with respiratory problems are most vulnerable, but even healthy people who are active outdoors can be affected when ozone levels are high. Chronic ozone exposure can induce morphological (tissue) changes throughout the respiratory tract, particularly at the junction of the conducting airways and the gas exchange zone in the deep lung. Anyone who spends time outdoors in the summer is at risk, particularly children and other people who are active outdoors. Even at very low levels, ground-level ozone triggers a variety of health problems, including aggravated asthma, reduced lung capacity, and increased susceptibility to respiratory illnesses such as pneumonia and bronchitis.

Ozone also damages vegetation and ecosystems. It leads to reduced agricultural crop and commercial forest yields; reduced growth and survivability of tree seedlings; and increased susceptibility to diseases, pests, and other stresses such as harsh weather. In the United States alone, ozone is responsible for an estimated $500 million in reduced crop production each year. Ozone also damages the foliage of trees and other plants, affecting the landscape of cities, national parks and forests, and recreation areas. In addition, ozone causes damage to buildings, rubber, and some plastics.

Ozone is a regional pollutant, as the reactions forming it take place over time, and downwind from the sources of the emissions. As a photochemical pollutant, ozone is formed only during daylight hours under appropriate conditions, but it is destroyed throughout the day and night. Thus, ozone concentrations vary depending upon both the time of day and the location. Even in pristine areas, some ambient ozone forms from natural emissions that are not controllable. This is termed background ozone. The average background ozone concentrations near sea level are in the range of 0.015 to 0.035 parts per million (ppm), with a maximum of about 0.04 ppm.

A federal standard for ozone had been set for a 1-hour averaging time of 0.12 ppm but was officially revoked in June 2005.

Reactive Organic Gases

Reactive organic gases (ROG) are defined as any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, that participates in atmospheric photochemical reactions. ROG consist of nonmethane hydrocarbons and oxygenated hydrocarbons. Hydrocarbons are organic compounds that contain only hydrogen and carbon atoms. Nonmethane hydrocarbons are hydrocarbons that do not contain the unreactive hydrocarbon, methane. Oxygenated hydrocarbons are hydrocarbons with oxygenated functional groups attached.

It should be noted that there is no State or national ambient air quality standard for ROG because the gases are not classified as criteria pollutants. They are regulated, however, because a reduction in ROG emissions reduces certain chemical reactions that contribute to the formulation of ozone. ROG are also transformed into organic aerosols in the atmosphere, which contribute to higher PM_{10} and lower visibility.

Nitrogen Oxides

During combustion of fossil fuels, oxygen reacts with nitrogen to produce nitrogen oxides or NO_x. This occurs primarily in motor vehicle internal combustion engines and fossil fuel-fired electric utility and industrial boilers. Whereas one form of NO_x, nitrogen dioxide (NO_2) is a criteria pollutant, NO_2 by itself is not a pollutant of concern in the Basin. Of concern is the property of NO_x as an ozone precursor, which means that when it is emitted into the atmosphere, it helps form or cause ozone to be formed. When NO_x and ROG are released in the atmosphere, they can chemically react with one another in the presence of sunlight to form ozone. NO_x can also be a precursor to PM_{10} and $PM_{2.5}$.

Because NO_x and ROG are ozone precursors, the health effects associated with ozone (as discussed above) are also indirect health effects associated with significant levels of NO_x and ROG emissions.

Particulate Matter (PM_{10} and $PM_{2.5}$)

Particle matter (PM) is the term for a mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small, they can only be detected using an electron microscope.

Particle pollution includes inhalable coarse particles, with diameters larger than 2.5 micrometers and smaller than 10 micrometers and fine particles, with diameters that are 2.5 micrometers and smaller. For reference, $PM_{2.5}$ is approximately one-thirtieth the size of the average human hair.

These particles come in many sizes and shapes and can be made up of hundreds of different chemicals. Some particles, known as primary particles, are emitted directly from a source, such as construction sites, unpaved roads, fields, smokestacks, or fires. Others form in complicated reactions in the atmosphere between such chemicals as sulfur dioxides (SO_x) and nitrogen oxides, which are emitted from power plants, industries, and automobiles. These particles, known as secondary particles, make up most of the fine particulate pollution in the country.

Particle exposure can lead to a variety of health effects. For example, numerous studies link particle levels to increased hospital admissions and emergency room visits—and even to death from heart or lung diseases. Both long- and short-term particle exposures have been linked to health problems. Long-term exposures, such as those experienced by people living for many years in areas with high particle levels, have been associated with problems such as reduced lung function and the development of chronic bronchitis and even premature death. Short-term exposures to particles (hours or days) can aggravate lung disease, causing asthma attacks and acute bronchitis, and may increase susceptibility to respiratory infections. In people with heart disease, short-term exposure has been linked to heart attacks and arrhythmias. Healthy children and adults have not been reported to suffer serious effects from short-term exposures, although they may experience temporary minor irritation when particle levels are elevated.

In 2005, BAAQMD released a Staff Report that identified sources of particulate matter in the Bay Area. Based on 2000–2003 ambient air monitoring data, BAAQMD and CARB estimated that the $PM_{2.5}$ fraction of total particulate matter accounted for approximately 60 percent of PM_{10} during the winter and approximately 45 percent during the rest of the year. On days when the PM standards are exceeded, $PM_{2.5}$ can account for as much as 90 percent of PM_{10}. On an annual basis, CARB estimated that $PM_{2.5}$ comprised approximately 50 percent of the PM_{10} levels.

Based on the inventory data, BAAQMD has determined that combustion activities such as residential wood burning, construction/demolition activities, road dust, and emissions from on- and off-road engines were identified as significant sources of PM_{10} emissions in the Bay Area. However, while the inventory was helpful in determining potential PM_{10} sources in the region, it did not provide the full picture of the makeup of the region's particulate matter. The nature of particulates is that larger, coarser particles tend to settle out of the air closer to their emission source, while smaller particles the size of $PM_{2.5}$ tend to remain suspended in the air longer and travel further.

BAAQMD's analysis showed that, for annual average $PM_{2.5}$, the largest source categories are on- and off-road motor vehicle exhaust and carbon from cooking and wood-burning activities. These categories include both directly emitted PM and secondary PM, such as ammonium nitrate formed by atmospheric reactions of ammonia with nitrogen oxides from motor vehicles and other combustion sources. Geological dust was found to be a minor component of ambient particulate matter.

Subsequently, it was determined that during the winter, residential wood smoke and cooking were major contributors to ambient particulate matter. Combustion $PM_{2.5}$, which includes vehicle exhaust, was the second major component of $PM_{2.5}$ and a significant component of PM_{10}. Ammonium nitrate was also a principal component of ambient PM. Road dust and other dust producing activities contributed to ambient PM_{10} but not significantly to $PM_{2.5}$ and had a more local impact.

Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless gas that is formed when carbon in fuel is not burned completely. It is a component of motor vehicle exhaust, which contributes about 56 percent of all CO emissions nationwide. Other non-road engines and vehicles (such as construction equipment and boats) contribute about 22 percent of all CO emissions nationwide. Higher levels of CO generally occur in areas with heavy traffic congestion. In cities, 85 to 95 percent of all CO emissions may come from motor vehicle exhaust. Other sources of CO emissions include industrial processes (such as metals processing and chemical manufacturing), residential wood burning, and natural sources such as forest fires. Woodstoves, gas stoves, cigarette smoke, and unvented gas and kerosene space heaters are sources of CO indoors. The highest levels of CO in the outside air typically occur during the colder months of the year when inversion conditions are more frequent. The air pollution becomes trapped near the ground beneath a layer of warm air.

CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. The health threat from lower levels of CO is most serious for those who suffer from heart disease such as angina, clogged arteries, or congestive heart failure. For a person with heart disease, a single exposure to CO at low levels may cause chest pain and reduce that person's ability to exercise; repeated exposures may contribute to other cardiovascular effects. High levels of CO can affect even healthy people. People who breathe high levels of CO can develop vision problems, reduced ability to work or learn, reduced manual dexterity, and difficulty performing complex tasks. At extremely high levels, CO is poisonous and can cause death.

Motor vehicles are the dominant source of CO emissions in most areas. CO is described as having only a local influence because it dissipates quickly. High CO levels develop primarily during winter, when periods of light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Because CO is a product of incomplete combustion, motor vehicles exhibit increased CO emission rates at low air temperatures. High CO concentrations occur in areas of limited geographic size sometimes referred to as hot spots. Since CO concentrations are strongly associated with motor vehicle emissions, high CO concentrations generally occur in the immediate vicinity of roadways with high traffic volumes and traffic congestion, active parking lots, and in automobile tunnels. Areas adjacent to heavily traveled and congested intersections are particularly susceptible to high CO concentrations.

Other Pollutants of Concern

Toxic Air Contaminants

In addition to the above-listed criteria pollutants, toxic air contaminants (TACs) are another group of pollutants of concern. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Cars and trucks release at least forty different toxic air contaminants. The most important, in terms of health risk, are diesel particulates, benzene, formaldehyde, 1,3-butadiene, and acetaldehyde. Public exposure to TACs can result from emissions from normal operations as well as accidental releases. Health effects of TACs include cancer, birth defects, neurological damage, and death.

Toxic air contaminants are less pervasive in the urban atmosphere than criteria air pollutants, but they are linked to short-term (acute) or long-term (chronic or carcinogenic) adverse human health effects. There are hundreds of different types of toxic air contaminants with varying degrees of toxicity. Sources of toxic air contaminants include industrial processes, commercial operations (e.g., gasoline stations and dry cleaners), and motor vehicle exhaust.

According to the 2005 California Almanac of Emissions and Air Quality, the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important of which is diesel particulate matter (DPM). DPM is a subset of $PM_{2.5}$ because the size of diesel particles are typically 2.5 microns and smaller. The identification of DPM as a toxic air contaminant in 1998 led CARB to adopt the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-fueled Engines and Vehicles in September 2000. The plan's goals are a 75-percent reduction in DPM by 2010 and an 85-percent reduction by 2020 from the 2000 baseline. Diesel engines emit a complex mixture of air pollutants, composed of gaseous and solid material. The visible emissions in diesel exhaust are known as particulate matter or PM, which includes carbon particles or "soot." Diesel exhaust also contains a variety of harmful gases and over 40 other cancer-causing substances. California's identification of DPM as a toxic air contaminant was based on its potential to cause cancer, premature deaths, and other health problems. Exposure to DPM is a health hazard, particularly to children whose lungs are still developing and the elderly who may have other serious health problems. Overall, diesel engine emissions are responsible for the majority of California's potential airborne cancer risk from combustion sources.

Asbestos

Asbestos is the name given to a number of naturally occurring, fibrous silicate minerals that have been mined for their useful properties such as thermal insulation, chemical and thermal stability, and high tensile strength. The three most common types of asbestos are chrysotile, amosite, and crocidolite. Chrysotile, also known as white asbestos, is the most common type of asbestos found in buildings. Chrysotile makes up approximately 90 to 95 percent of all asbestos contained in buildings in the United States.

In addition, asbestos is also found in a natural state. Exposure and disturbance of rock and soil that naturally contain asbestos can result in the release of fibers to the air and consequent exposure to the public. Asbestos most commonly occurs in ultramafic rock that has undergone partial or complete alteration to serpentine rock (serpentinite) and often contains chrysotile asbestos. In addition, another form of asbestos, tremolite, can be found associated with ultramafic rock, particularly near faults. Sources of asbestos emissions include unpaved roads or driveways surfaced with ultramafic rock, construction activities in ultramafic rock deposits, or rock quarrying activities where ultramafic rock is present.

To address some of the health concerns associated with exposure to asbestos from these activities, CARB has adopted two Airborne Toxic Control Measures (ATCMs). CARB has an ATCM for construction, grading, quarrying, and surface mining operations requiring the implementation of mitigation measures to minimize emissions of asbestos-laden dust. This ATCM applies to road construction and maintenance, construction and grading operations, and quarries and surface mines when the activity occurs in an area where naturally occurring asbestos is likely to be found. Areas are subject to the regulation if they are identified on maps published by the Department of Conservation as ultramafic rock units or if the Air Pollution Control Officer or owner/operator has knowledge of the presence of ultramafic rock, serpentine, or naturally occurring asbestos on the site. The ATCM also applies if ultramafic rock, serpentine, or asbestos is discovered during any operation or activity.

In addition, CARB has an ATCM for surfacing applications. This ATCM applies to any person who produces, sells, supplies, offers for sale or supply, uses, applies, or transports any (1) aggregate material extracted from property where any portion of the property is located in a geographic ultramafic rock unit or (2) aggregate material extracted from property that is NOT located in a geographic ultramafic rock unit if the material has been evaluated at the request of the Air Pollution Control Officer and has been determined to be ultramafic rock or serpentine; tested at the request of the Pollution Control Officer and determined to have an asbestos content of 0.25 percent or greater; or determined by the owner/operator of a facility to be ultramafic rock, serpentine, or material that has an asbestos content of 0.25 percent or greater. The ATCM prohibits persons from using, applying, selling, supplying, or offering for sale or supply any restricted material for surfacing unless it has been tested and determined to have an asbestos content of less than 0.25 percent.)

Greenhouse Gases

Constituent gases of the Earth's atmosphere called atmospheric greenhouse gases play a critical role in the Earth's radiation budget by trapping infrared radiation emitted from the Earth's surface, which otherwise would have escaped to space. Prominent greenhouse gases contributing to this process include carbon dioxide (CO_2), methane (CH_4), ozone, water vapor, nitrous oxide (N_2O), and chlorofluorocarbons (CFCs). This phenomenon, known as the Greenhouse Effect, is responsible for maintaining a habitable climate. Anthropogenic emissions of these greenhouse gases in excess of natural ambient concentrations are responsible for the enhancement of the Greenhouse Effect and have led to a trend of unnatural warming of the Earth's natural climate, known as global warming or climate change. Emissions of gases that induce global warming are attributable to human activities associated with industrial/manufacturing, utilities, transportation, residential, and agricultural sectors. Transportation is responsible for 41 percent of the State's greenhouse gas emissions, followed by electricity generation. Emissions of CO_2 and NO_x are byproducts of fossil fuel combustion. Methane, a potent greenhouse gas, results from off-gassing associated with agricultural practices and landfills. Sinks of CO_2 include uptake by vegetation and dissolution into the ocean.

Global warming is a global problem, and greenhouse gases are global pollutants, unlike criteria air pollutants and TACs, which are pollutants of regional and local concern. Worldwide, California is the 12^{th} to 16^{th} largest emitter of CO_2, and is responsible for approximately 2 percent of the world's

CO_2 emissions. In 2004, California produced 492 million gross metric tons of carbon dioxide-equivalent.

Various local and statewide initiatives to reduce the State's contribution to greenhouse gas emissions have raised awareness that, even though the possible outcomes and feedback mechanisms associated with climate change are not yet fully understood, global warming is already upon us, and the potential for environmental, social, and economic disaster over the long term has the potential to be great. Cooperation on a global scale will be required to reduce greenhouse gas emissions to a level that will slow the warming trend, and the direct air quality impact of increasing greenhouse gas emissions into the global system is incrementally cumulative.

Direct and Indirect Aerosol Effects

Aerosols, including particulate matter, reflect sunlight back to space. As attainment designations for particulate matter are met, and fewer particulate matter emissions occur, the cooling effect of anthropogenic aerosols would be reduced, and instead, the greenhouse effect would be further enhanced. Similarly, aerosols act as cloud condensation nuclei to aid in cloud formation and increase cloud lifetime. Clouds efficiently reflect radiation back to space.

The indirect effect of aerosols on clouds and precipitation efficiency would be reduced, amplifying the greenhouse effect again.

Cloud Effect

As global temperature rises, the ability of the air to hold moisture increases, and facilitation of cloud formation occurs. If the increase in cloud cover occurs at low or middle altitudes, resulting in clouds with greater liquid water path such as stratus or cumulus clouds, more radiation would be reflected back to space, resulting in a negative feedback, wherein the side effect of global warming acts to balance itself. If cloud formation occurs at higher altitudes in the form of cirrus clouds, these clouds actually allow more light to pass through than they reflect and ultimately, act as greenhouse gases themselves, thus resulting in a positive feedback wherein the side effect of global warming acts to enhance the process. This feedback mechanism, known as the Cloud Effect, is not well understood.

Other Feedback Mechanisms

As global temperature continues to rise, methane gas, which is trapped in permafrost, would be released into the atmosphere. Methane is approximately 20 times as efficient a greenhouse gas as CO_2. This phenomenon would accelerate and enhance the warming trend. Additionally, as polar and sea ice extent continues to diminish, the Earth's albedo, or reflectivity, would simultaneously decrease. More incoming solar radiation would be absorbed by the Earth rather than reflected back to space, in turn, further enhancing the Greenhouse Effect and associated global warming. These and other competing feedback mechanisms are still in the process of being coupled and forecast by the scientific community. It is not known at this time how the ultimate balance among all the variables will be equated to a particular temperature increment. Regardless, there is no longer debate within the scientific community that anthropogenic greenhouse gas emissions are linked to a trajectory of unnatural warming of the planet.

As defined under AB 32, greenhouse gas emissions include the following: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Global Warming Potential

Greenhouse gases have varying global warming potential (GWP). The GWP is the potential of a gas or aerosol to trap heat in the atmosphere; it is the **"**cumulative radiative forcing effects of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas.**"** One teragram of carbon dioxide equivalent (Tg CO_2 Eq.) is essentially the emissions of the gas multiplied by the GWP. One teragram is equal to one million metric tons. The carbon dioxide equivalent is a good way to assess emissions because it gives weight to the GWP of the gas. A summary of the atmospheric lifetime and GWP of selected gases is summarized in Table 4.2-1. As shown in the table, GWP ranges from 1 to 23,900.

Table 4.2-1: Global Warming Potential

Greenhouse Gas	Global Warming Potential (100-year time horizon)
Carbon dioxide (CO_2)	1
Methane (CH_4)	21
Nitrous oxide (N_2O)	310
HFC-23	11,700
HFC-134a	1300
HFC-152a	140
PFC: Tetrafluoromethane (CF_4)	6,500
PFC: Hexafluoroethane (C_2F_6)	9,200
Sulfur hexafluoride (SF_6)	23,900
Source: United States Environmental Protection Agency, 2006.	

Local Air Quality

Emission Sources

California is a diverse state with many sources of air pollution. To estimate the sources and quantities of pollution, CARB, in cooperation with local air districts and industry, maintains an inventory of California emission sources. Sources are subdivided into four major emission categories: stationary sources, areawide sources, mobile sources, and natural sources. Stationary source emissions are based on estimates made by facility operators and local air districts. Emissions from specific facilities can be identified by name and location. CARB and local air district staffs estimate area-wide emissions. Emissions from area-wide sources may be either from small individual sources, such as residential fireplaces, or from widely distributed sources that cannot be tied to a single location, such as consumer products and dust from unpaved roads. CARB staff estimates mobile source emissions with assistance from districts and other government agencies. Mobile sources include on-road cars, trucks, and buses and other sources such as boats, off-road recreational vehicles, aircraft, and trains. CARB staff and the air districts also estimate natural sources. These sources include geogenic (e.g., petroleum seeps), biogenic (vegetation) sources, and wildfires.

Table 4.2-2 summarizes estimated 2005 emissions of key criteria air pollutants from major categories of air pollutant sources. For each pollutant, estimated emissions are presented for Contra Costa County. No further spatial refinement is available.

Table 4.2-2: Contra Costa County 2005 Emissions Inventory (tons/day)

Emission Category	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$
Fuel combustion	1.95	14.36	21.90	3.27	3.24
Waste disposal	0.44	0.01	0.11	0	0
Cleaning and surface coatings	2.87	0	0	0	0
Petroleum production and marketing	14.24	12.30	0.72	0.59	0.54
Industrial processes	3.11	0.94	2.26	1.94	1.33
Solvent evaporation	10.73	0	0	0	0
Miscellaneous processes	2.37	25.00	2.89	23.97	7.80
On-road motor vehicles	22.51	224.95	39.48	1.39	0.93
Other mobile sources	8.91	68.98	27.39	1.82	1.64
Natural sources	11.35	0.12	0	0.01	0.01
TOTAL	**78.48**	**346.66**	**94.75**	**32.99**	**15.49**

Notes:
All values in tons per day. 2005 is estimated from a base year inventory for 2004 based on growth and control factors available from CARB. The sum of values may not equal total shown due to rounding.
Source: California Air Resources Board, 2007.

Contra Costa County is similar to many other portions of California and the United States in general, in that a large portion of the CO emissions comes from on-road mobile sources (65 percent), with the majority coming from passenger cars and trucks. On-road mobile sources are also a primary source of NO_x but to a lesser degree, with 42 percent coming from passenger cars and trucks. Heavy-duty diesel trucks supply a large portion (26 percent) of that on-road NO_x total. Other significant NO_x sources in Contra Costa County include off-road equipment primarily from construction (19 percent) and petroleum refining combustion (13 percent). In Contra Costa County, almost 30 percent of the ROG emissions come from on-road motor vehicles, another 15 percent come from biogenic sources, and 9 percent come from consumer products. PM_{10} primarily comes from an emissions category called “miscellaneous processes,” which includes a variety of subcategories. In the case of Contra Costa County’s emissions, these subcategories are primarily paved road dust, construction and demolition, and residential fuel combustion. Even though the majority of $PM_{2.5}$ also comes from the same subcategories, another significant source is from combustion (21 percent) primarily from petroleum refineries.

Monitoring Data

Meteorology acts on the emissions released into the atmosphere to produce pollutant concentrations. These airborne pollutant concentrations are measured throughout California at air quality monitoring sites. CARB operates a statewide network of monitors. Data from this network are supplemented with data collected by local air districts, other public agencies, and private contractors. There are more than 250 criteria pollutant monitoring sites in California. Each year, more than ten million air quality measurements from all of these sites are collected and stored in a comprehensive air quality database maintained by CARB.

Existing levels of ambient air quality and historical trends and projections of air quality in the project area are best documented from measurements made near the project site. The air quality monitoring station closest to the site is located in Hayward on La Mesa Drive, approximately 8 miles south-southwest of San Ramon. The only pollutant measured at this station is ozone. The nearest monitoring station measuring particulate matter, carbon monoxide, and nitrogen dioxide is located in Livermore on Rincon Avenue, approximately 11 miles southeast of San Ramon. Table 4.2-3 summarizes 2004–2006 published monitoring data. The data shows that no federal standards were exceeded at any of the nearest air monitoring stations. The State standard for ozone during a 1-hour average was exceeded only twice in 2006 at the Hayward station, and the State standard for PM_{10} during a 24-hour period and as an annual average was exceeded only three times in 2006 at the Livermore station. The data shows that no exceedances of State or federal standards were recorded in 2004 and 2005.

Table 4.2-3: Ambient Air Monitoring Data (2004–2006)

Air Pollutant, Averaging Time (Units)	2004	2005	2006
Ozone (Hayward)			
Max 1 Hour (ppm) Days > CAAQS (0.09 ppm)	0.088 0	0.093 0	**0.101** 2
Max 8 Hour (ppm) Days > CAAQS (0.07 ppm) Days > NAAQS (0.08 ppm)	0.070 ND 0	0.070 ND 0	0.071 ND 0
Particulate Matter (PM_{10}) (Livermore)			
Mean (μg/m^3)	20.0	18.8	**21.8**
24 Hour (μg/m^3) Days > CAAQS (50 μg/m^3) Days > NAAQS (150 μg/m^3)	48.8 0 0	49.4 0 0	**69.2** 3 0

Table 4.2-3 (Cont.): Ambient Air Monitoring Data (2004–2006)

Air Pollutant, Averaging Time (Units)	2004	2005	2006
Particulate Matter ($PM_{2.5}$) (Livermore)			
Mean (µg/m^3)	10.2	9.0	ID
24 Hour (µg/m^3) Days > NAAQS (35 µg/m^3)	40.8 0	32.1 0	50.8 0
Carbon Monoxide (Livermore)			
Max 8 Hour (ppm) Days > CAAQS (9.0 ppm) Days > NAAQS (9.0 ppm)	1.81 0 0	1.79 0 0	1.79 0 0
Nitrogen Dioxide (Livermore)			
Mean (ppm)	0.014	0.014	0.014
Max 1 Hour (ppm) Days > CAAQS (0.25 ppm)	0.063 0	0.072 0	0.064 0

Abbreviations:
> = exceed ppm = parts per million µg/m3 = micrograms per cubic meter
ID = insufficient data ND = no data max = maximum
CAAQS = California Ambient Air Quality Standard NAAQS = National Ambient Air Quality Standard
Mean = Annual Arithmetic Mean
Source: California Air Resources Board, 2007.

Sensitive Receptors

The location of a development project is a major factor in determining whether it will result in localized air quality impacts. The potential for adverse air quality impacts increases as the distance between the source of emissions and members of the public decreases. Impacts on sensitive receptors are of particular concern. Sensitive receptors are defined as facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Hospitals, schools, convalescent facilities, and residential areas are examples of sensitive receptors. Commercial and industrial facilities are not included in the definition because employees do not typically remain onsite for 24 hours. However, when assessing the impact of pollutants with 1-hour or 8-hour standards (such as nitrogen dioxide and carbon monoxide), commercial and/or industrial facilities would be considered sensitive receptors. Sensitive receptors in the project vicinity are summarized in Table 4.2-4. As mentioned above, residential areas are examples of sensitive receptors. The Marriot Residence Inn and the Reflections Condominiums are considered sensitive receptors because of the potential for children and the elderly to reside in these developments.

Table 4.2-4: Sensitive Receptors

Sensitive Receptor	Address	Relationship to Project Site
Marriot Residence Inn	1071 Market Place	180 feet east of Parcel 1A
Reflections Condominiums	205 Reflections Drive	210 feet east of Parcel 1A

Table 4.2-4 (Cont.): Sensitive Receptors

Sensitive Receptor	Address	Relationship to Project Site
Iron Horse Middle School	12601 Alcosta Boulevard	2,000 feet northeast of Parcel 3A
Source: Michael Brandman Associates, 2007.		

4.2.3 - Regulatory Framework

Air pollutants are regulated at the national, State, and air basin level; each agency has a different degree of control. The EPA regulates at the national level, CARB at the State level, and BAAQMD at the air basin level.

Federal

The EPA handles global, international, national, and interstate air pollution issues and policies. The EPA sets national vehicle and stationary source emission standards; oversees approval of all State Implementation Plans (SIP); provides research and guidance in air pollution programs; and sets National Ambient Air Quality Standards (NAAQS), also known as federal standards. There are NAAQS for six common air pollutants, called criteria air pollutants, which were identified from provisions of the federal Clean Air Act (CAA) of 1970. The six criteria pollutants are:

- Ozone (O_3)
- Particulate matter (PM_{10} and $PM_{2.5}$)
- Nitrogen dioxide (NO_2)
- Carbon monoxide (CO)
- Lead
- Sulfur dioxide (SO_2)

The NAAQS were set to protect the health of sensitive individuals; thus, the standards continue to change as more medical research is available regarding the health effects of the criteria pollutants.

State

CARB has overall responsibility for statewide air quality maintenance and air pollution prevention. The SIP for the State of California is administered by CARB. A SIP is a document prepared by each state describing existing air quality conditions and measures that will be followed to attain and maintain NAAQS. CARB also administers California ambient air quality standards, or State standards, for the ten air pollutants designated in the California Clean Air Act (CCAA). All of the national criteria pollutants are also regulated by the State, but California adds four pollutants. The additional State air pollutants are:

- Visibility reducing particulates
- Hydrogen sulfide

- Sulfates
- Vinyl chloride

The national and State ambient air quality standards and the most relevant effects are summarized in Table 4.2-5.

Table 4.2-5: Ambient Air Quality Standards

Air Pollutant	Averaging Time	California Standard	National Standard	Most Relevant Effects
Ozone	1-hour	0.09 ppm	—	(a) Pulmonary function decrements and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function
	8-hour	0.070 ppm	0.08 ppm	
				decrements in chronically exposed humans; (e) Vegetation damage; (f) Property damage
Carbon monoxide (CO)	1-hour	20 ppm	35 ppm	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) impairment of central nervous system functions; (d) possible increased risk to fetuses
	8-hour	9.0 ppm	9 ppm	
Nitrogen dioxide (NO_2)	1-hour	0.18 ppm*	—	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) contribution to atmospheric discoloration
	Mean	0.030 ppm*	0.053 ppm	
Sulfur dioxide (SO_2)	1-hour	0.25 ppm	—	Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma
	24 hours	0.04 ppm	0.14 ppm	
	Mean	—	0.030 ppm	
Particulate matter (PM_{10})	24-hour	50 µg/m3	150 µg/m3	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) declines in pulmonary function growth in children; (c) increased risk of premature death from heart or lung diseases in the elderly
	Mean	20 µg/m3	—	
Particulate matter ($PM_{2.5}$)	24-hour	—	35 µg/m3	
	Mean	12 µg/m3	15 µg/m3	

Table 4.2-5 (Cont.): Ambient Air Quality Standards

Air Pollutant	Averaging Time	California Standard	National Standard	Most Relevant Effects
Sulfates	24-hour	25 µg/m3	—	(a) Decrease in ventilatory function; (b) aggravation of asthmatic symptoms; (c) aggravation of cardio-pulmonary disease; (d) vegetation damage; (e) degradation of visibility; (f) property damage
Lead	30-day	1.5 µg/m3	—	(a) Learning disabilities; (b) impairment of blood formation and nerve conduction
	Quarter	—	1.5 µg/m^3	

Abbreviations:
ppm = parts per million µg/m^3 = micrograms per cubic meter
Mean = Annual Arithmetic Mean 30-day = 30-day average Quarter = Calendar quarter
* The nitrogen dioxide ambient air quality standard was amended on February 22, 2007. These changes become effective after regulatory changes are submitted and approved by the Office of Administrative Law, expected in 2007.
Source: CARB, Ambient Air Quality Standards, 2007.

Greenhouse Gas Emissions

CARB has not identified a significance threshold for greenhouse gas emissions to use in CEQA documents. In addition, no air district in California has generated a significance threshold pertaining to greenhouse gas emissions. The State has identified statewide emissions in the year 1990 as a goal through the adoption of AB 32. It is recognized, though, that there is no simple measure available to determine if a single project would advance toward or away from this goal. Because greenhouse gases are global, a project that shifts the location of where someone lives or works, by itself, may or may not contribute new greenhouse gases. For example, if a person were to move from Southern California to the Bay Area, it is not conclusive that this would result in generation of more greenhouse gas emissions globally. In fact, if a person moves from one location—where they have long commutes and a land use pattern that requires substantial energy use, to a project that promotes shorter and fewer vehicle trips, more walking, and less energy use—it could be argued that the new project would result in a potential reduction in generation of global greenhouse gas emissions.

The California Energy Commission issued a report in June 2007, titled "The Role of Land Use in Meeting California's Energy and Climate Change Goals," which asserted that lengthy commutes and reliance on private vehicles are two of the leading causes of greenhouse gas emissions in California. The report recommended using land use planning tools to promote reductions in vehicle usage and trip length through mixed-use and transit-oriented development.

The California Environmental Protection Agency Climate Action Team developed a report that "proposes a path to achieve the Governor's targets that will build on voluntary actions of California businesses, local government and community actions, and State incentive and regulatory programs" needed to reduce activities that contribute to global climate change. There are no adopted thresholds to assess the significance of project impacts. The report indicates that the strategies will reduce California's emissions to the levels proposed in Executive Order S-3-05.

The California State Legislature adopted AB 32, the California Global Warming Solutions Act of 2006. AB 32 requires CARB, the State agency charged with regulating statewide air quality, to adopt rules and regulations that by 2020 would achieve a reduction in greenhouse gas emissions equivalent to the statewide inventory levels of 1990. On or before June 30, 2007, CARB is required to publish a list of discrete greenhouse gas emission reduction measures that can be implemented. On April 20, 2007, CARB published their proposed early actions that include discrete early action measures, additional greenhouse gas reduction strategies, and criteria and toxic control measures.

The basis for these greenhouse gas reduction goals that California has adopted into law is provided in the IPCC climate models, which predict the climate stabilizing at an approximately 2-degree-Celsius rise in average temperatures long term.

Bay Area Air Quality Management District

BAAQMD regulates air quality in the San Francisco Bay Area Air Basin, which consists of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties; the western portion of Solano County; and the southern portion of Sonoma County. BAAQMD is responsible for controlling and permitting industrial pollution sources (such as power plants, refineries, and manufacturing operations) and widespread areawide sources (such as bakeries, dry cleaners, service stations, and commercial paint applicators), and for adopting local air quality plans and rules.

The most recent air quality plan in the Air Basin is the Bay Area 2005 Ozone Strategy, which was prepared in cooperation with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) and was adopted on January 4, 2006. The Strategy identifies how the San Francisco Bay Area will achieve compliance with the State one-hour air quality standard for ozone as expeditiously as practicable and how the region will reduce transport of ozone and ozone precursors to neighboring air basins.

Attainment Status

Air basins where ambient air quality standards are exceeded are referred to as "nonattainment" areas. If standards are met, the area is designated as an "attainment" area. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered "unclassified." National nonattainment areas are considered severe, serious, or moderate as a function of deviation from standards.

As shown in Table 4.2-6, the Bay Area is in nonattainment for the national and State 1-hour ozone standard and the State PM_{10} standard. As shown in the table, the Bay Area is in nonattainment for the State 1-hour ozone standard, national 8-hour ozone standard, State 24-hour and annual PM_{10} standard, and the State annual $PM_{2.5}$ standard. This means that the area experiences poor air quality at times.

Table 4.2-6: Bay Area Air Basin Attainment Status

Pollutant	Averaging Time	State Status	National Status
Ozone	1-hour	Nonattainment	Not applicable[1]
	8-hour	Unclassified	Nonattainment[2]
Carbon monoxide	1-hour and 8-hour	Attainment	Attainment[3]
Nitrogen dioxide	1-hour	Attainment	No federal standard
	Annual	No State standard	Attainment
Sulfur dioxide	24-hour; 1-hour	Attainment	Attainment
PM_{10}	24-hour	Nonattainment	Unclassified
	Annual	Nonattainment	No federal standard[4]
$PM_{2.5}$	24-hour	No State standard	Unclassified
	Annual	Nonattainment	Attainment

Notes:
1 The national 1-hour ozone standard was revoked by EPA on June 15, 2005.
2 In June 2004, the Bay Area was designated as a marginal nonattainment area of the national 8-hour ozone standard.
3 In April 1998, the Bay Area was redesignated to attainment for the national 8-hour carbon monoxide standard.
4 EPA revoked the annual PM_{10} standard on September 21, 2006.
Source: Bay Area Air Quality Management District, 2007.

Regional Significance Thresholds

As stated in Appendix G, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the above determinations. These thresholds are primarily based on the BAAQMD CEQA Guidelines. However, BAAQMD is in the process of updating these Guidelines, and, therefore, practical modifications of some of the published thresholds are being recommended in practice. Where a difference is recommended, it will be so noted. The BAAAQMD suggest that an air quality impact is considered significant if implementation of the proposed project or alternatives under consideration would result in any of the impacts discussed below.

Construction Impacts

Construction-related emissions are generally short-term in duration, but may still cause adverse air quality impacts. The BAAQMD historically considered PM_{10} the pollutant of greatest concern deriving from construction activities. PM_{10} emissions can result from a variety of construction activities, including excavation, grading, demolition, pile driving, vehicle travel on paved and unpaved surfaces, and vehicle and equipment exhaust. BAAQMD is concerned that construction-related emissions can cause substantial increases in localized concentrations of PM_{10} and can lead to adverse health effects, as well as nuisance concerns such as reduced visibility and soiling of exposed surfaces.

Historically, BAAQMD had identified a set of feasible PM_{10} control measures for construction activities that were considered the determining factor of significance for construction activities.

However, BAAQMD is increasingly recognizing the importance of PM_{10} and $PM_{2.5}$ from construction activities and the emissions of carbon monoxide and ozone precursors from construction equipment. Therefore, BAAQMD now recommends that quantification of construction emissions is necessary.

Since the BAAQMD have not yet officially set specific thresholds of significance for construction activities but would like analyses to assign them greater importance, this report will use the threshold established by the BAAQMD for operational emissions. Therefore, an air quality impact is considered significant if implementation of the proposed project or alternatives under consideration would generate construction-related emissions that exceed 80 lb/day for NO_x, ROG, or PM_{10}.

Project Operations

For many types of land use development, such as office parks, shopping centers, residential subdivisions and other "indirect sources", motor vehicles traveling to and from the projects represent the primary source of air pollutant emissions associated with project operations. Significance thresholds established by the BAAQMD are discussed below and address the impacts of these indirect source emissions on local and regional air quality. Thresholds are also provided for other potential impacts related to project operations, such as odors and toxic air contaminants.

Total Emissions

Total emissions from project operations should be compared to the thresholds provided in Table 4.2-7. Total operational emissions evaluated under this threshold should include all emissions from motor vehicle use associated with the project. A project that generates criteria air pollutant emissions in excess of the annual or daily thresholds in the table below would be considered to have a significant air quality impact.

Table 4.2-7: BAAQMD Operational Significance Thresholds

Pollutant	Operation (pounds per day)
Oxides of nitrogen (NO_x)	80
Reactive organic gases (ROG)	80
Particulate matter (PM_{10})	80
Source: BAAQMD CEQA Guidelines, 1999.	

Local Carbon Monoxide Concentrations

Localized carbon monoxide concentrations should be estimated for projects in which (1) vehicle emissions of CO would exceed 550 pounds per day; (2) project traffic would significantly impact intersections or roadway links operating at Level of Service (LOS) D, E, or F or would cause LOS to decline to D, E, or F; or (3) project traffic would increase traffic volumes on nearby roadways by 10 percent or more unless the increase in traffic volume is less than 100 vehicles per hour. A project contributing to CO concentrations exceeding the CAAQS of 9 ppm averaged over 8 hours and 20 ppm for 1 hour would be considered to have a significant impact.

Odors

While offensive odors rarely cause any physical harm, they still can be very unpleasant, leading to considerable distress among the public and often generating citizen complaints to local governments and the District. Any project with the potential to frequently expose members of the public to objectionable odors would be deemed to have a significant impact.

Greenhouse Gases

The BAAQMD is one of the most proactive air districts in the State concerning greenhouse gas emissions and climate change issues. In 2005, BAAQMD initiated a Climate Protection Program, and on June 1, 2005, the District Board of Directors adopted a resolution establishing a Climate Protection Program and acknowledging the link between climate protection and programs to reduce air pollution in the Bay Area. A central element of BAAQMD's climate protection program is the integration of climate protection activities into existing District programs. In addition, BAAQMD's climate protection program emphasizes collaboration with ongoing climate protection efforts at local and State levels, public education and outreach, and technical assistance to cities and counties. In November 2006, BAAQMD prepared a district-wide Source Inventory of Bay Area Greenhouse Gas Emissions.

Cumulative Impacts

The BAAQMD has set the threshold for cumulative significance, as any proposed project that would individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact. Additionally, for any project that does not individually have significant operational air quality impacts, the determination of significant cumulative impact should be based on an evaluation of the consistency of the project with the local general plan and of the general plan with the regional air quality plan.

If a project is proposed in a city or county with a general plan that is consistent with the Clean Air Plan and the project is consistent with that general plan (i.e., it does not require a general plan amendment), then the project will not have a significant cumulative impact (provided, of course, the project does not individually have any significant impacts). No further analysis regarding cumulative impacts is necessary.

Local

Local government's responsibility for air quality increased significantly with the passage of the CCAA and the federal CAA 1990 amendments. Both of these pieces of legislation placed new emphasis on reducing motor vehicle trips and vehicle miles traveled at the local level. Although the District is required to address air quality standards by way of transportation control measures (TCMs) and indirect source programs in its air quality attainment plans, cities and counties, through their Councils of Government, are responsible for much of the implementation.

The City of San Ramon General Plan, voter-approved March 5, 2002, contains guiding and implementing policies that together articulate a vision for San Ramon and provides protection for the City's resources by establishing planning requirements, programs, standards, and criteria for project review. Listed below are policies and programs contained in the General Plan that are pertinent to the protection of air quality.

4.2.4 - Methodology

Michael Brandman Associates prepared a stand-alone air quality analysis of the proposed project in June 2007. The air quality analysis was prepared using the BAAQMD CEQA Guidelines and supplemented with information included in the Traffic Operations Evaluation prepared for the proposed project by DMJM Harris (see Section 4.12, Transportation). Data included LOS calculations, average daily vehicle trips, and turning movements at intersections. This information was used to determine the operational vehicular emissions of the proposed project. Daily increases in vehicular and area emissions associated with the proposed project were estimated using the CARB-approved URBEMIS2007 Version 9.2 computer program based on default assumptions contained in the model. Constriction emissions were also modeled using URBEMIS2007 Version 9.2. The CO hot spot analysis was prepared in accordance with the University of California, Davis Institute of Transportation Studies document, Transportation Project-Level Carbon Monoxide Protocol.

4.2.5 - Thresholds of Significance

According to the CEQA Guidelines' Appendix G Environmental Checklist, to determine whether impacts to air quality are significant environmental effects, the following questions are analyzed and evaluated:

> Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations.
>
> Would the project:
>
> a.) Conflict with or obstruct implementation of the applicable air quality plan?
>
> b.) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?
>
> c.) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?
>
> d.) Expose sensitive receptors to substantial pollutant concentrations?
>
> e.) Create objectionable odors affecting a substantial number of people?

4.2.6 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the development of the project and provides mitigation measures where appropriate.

Construction and Operational Emissions

Impact AIR-1:	The proposed project would result in substantial emissions of criteria pollutants during construction and operations.

Impact Analysis

This impact analyzes air emissions associated with construction and operation of the proposed project. Each topic is discussed separately.

Construction Emissions

Short-term impacts will include fugitive dust and other particulate matter, as well as exhaust emissions generated by earthmoving activities and operation of grading equipment during site preparation. Construction emissions are caused by onsite or offsite activities. Onsite emissions principally consist of exhaust emissions (NO_x, SO_x, CO, ROG, PM_{10}, and $PM_{2.5}$) from heavy-duty construction equipment, motor vehicle operation, and fugitive dust (mainly PM_{10}) from disturbed soil. Offsite emissions are caused by motor vehicle exhaust from delivery vehicles, as well as worker traffic, but also include road dust (PM_{10}). Major construction-related activities include the following:

- Grading/clearing, including the excavation
- Excavation and earthmoving for infrastructure construction of the utilities, both on- and offsite, and dwelling unit foundations and footings
- Building construction
- Asphalt paving of access roads throughout the development
- Application of architectural coatings for things such as dwelling stucco and interior painting

Construction equipment such as scrapers, bulldozers, forklifts, backhoes, water trucks, and industrial saws are expected to be used on the project site and will result in exhaust emissions. During the finishing phase, paving operations and application of architectural coatings will release ROG emissions. Construction emission can vary substantially from day to day, depending on the level of activity, the specific type of operation, and prevailing weather conditions.

Because no information was available about the proposed project's construction fleet at the time of this writing, fleet assumptions were derived from a spreadsheet developed by the San Joaquin Valley Unified Air Pollution Control District for its Indirect Source Rule. Construction emissions include demolition of Bishop Ranch 2, as well as grading, building construction, and paving. The project's construction plan is to phase out construction of the projects different parcels over a period of years. The construction timeline is detailed in Table 4.2-8. Because the threshold of significance is based on maximum pounds per day and the construction timeline has overlapping schedules, more than one parcel would be having activity at the same time. Therefore, construction emissions were estimated on a maximum-pounds-per-day basis for each year of activity.

Table 4.2-8: Estimated Project Construction Plan

Parcel	Commencement of Construction	Duration of Construction
Plaza District	Fall 2008	24 months
Bishop Ranch 1A – Phase 1	Mid-2008	14 months
Bishop Ranch 1A – Phase 2	Mid-2009	14 months
Bishop Ranch 1A – Phase 3	Mid-2010	14 months
City Hall and Transit Center	Mid-2009	18 months
Source: Sunset Development Company, 2007.		

Table 4.2-9 summarizes these construction-related emissions (without mitigation) for the proposed Project. Only emissions with quantifiable thresholds are presented. The emission estimates were derived from the project description using the CARB URBEMIS2007 Version 9.2 emission model.

Table 4.2-9: Project Construction Emissions (Unmitigated)

Year	Maximum Emissions (lbs/d)			
	ROG	NO_x	CO	PM_{10}
Regional Threshold	80.0	80.0	550.0	80.0
Year 2008	46.1	456.6	224.0	403.1
Significant Impact?	No	**Yes**	No	**Yes**
Year 2009	343.6	575.1	417.5	496.6
Significant Impact?	**Yes**	**Yes**	No	**Yes**
Year 2010	461.6	306.8	326.0	83.0
Significant Impact?	**Yes**	**Yes**	No	**Yes**
Year 2011	141.1	39.0	44.1	2.8
Significant Impact?	**Yes**	No	No	No
Source: Michael Brandman Associates, 2007.				

The information shown in Table 4.2-9 indicates that for the proposed project, the BAAQMD construction emission thresholds will be exceeded in 2008 for NO_x and PM_{10} emissions; in 2009 and 2010 for ROG, NO_x, and PM_{10} emissions; and in 2011 for ROG emissions only. Therefore, construction emissions are considered to have a significant impact.

Mitigation is proposed that would require the implementation of construction air pollution control measures. Table 4.2-10 summarizes the mitigated construction-related emissions for the proposed project. Only emissions with quantifiable thresholds are presented. The emission estimates with mitigations were derived from the project description using the CARB URBEMIS2007 Version 9.2 emission model. As shown in Table 4.2-10, after the implementation of mitigation, BAAQMD construction emission thresholds would still be exceeded in 2008 for NO_x and PM_{10} emissions; in 2009 for ROG, NO_x, and PM_{10} emissions; in 2010 for ROG and NO_x emissions; and in 2011 for ROG emissions. Therefore, construction emissions would be a significant unavoidable impact of the proposed project.

Table 4.2-10: Mitigated Project Construction Emissions

Year	Maximum Emissions (lbs/day)			
	ROG	NO_x	CO	PM_{10}
Regional Threshold	80.0	80.0	550.0	80.0
Year 2008	46.1	456.6	224.0	156.1
Significant Impact?	No	**Yes**	No	**Yes**
Year 2009	343.6	575.1	417.5	193.2
Significant Impact?	**Yes**	**Yes**	No	**Yes**
Year 2010	461.6	306.8	326.0	38.5
Significant Impact?	**Yes**	**Yes**	No	No
Year 2011	141.1	39.0	44.1	2.6
Significant Impact?	**Yes**	No	No	No
Source: Michael Brandman Associates, 2007.				

Toxic Air Contaminants

Project construction activities would involve demolition of Bishop Ranch 2, a 194,652-square-foot office complex that was constructed in the early 1980s. The federal ban on asbestos and lead building materials was instituted in 1978 and, therefore, the Bishop Ranch 2 structures do not contain these materials; therefore, demolition of Bishop Ranch 2 would not expose construction workers or the public to asbestos or lead air pollutants. Impacts would be less than significant.

Construction activities would also involve the use of diesel-powered construction equipment, which emit DPM. The CARB has identified DPM emissions as the primary TACs of concern for mobile sources. Risk assessments for residential areas exposed to TACs are generally based on a 70-year period of exposure. Construction is scheduled to begin in mid-2008 and end in late 2011. Since the use of construction equipment would be temporary and would not be close to the 70-year timeframe, exposure of sensitive receptors to TACs would not be substantial. Mitigation Measure AIR-1a includes measures that would reduce emissions of TACs. Even without this mitigation measure, emissions of DPM would not be substantial enough to be considered a significant health risk. Therefore, impacts would be less than significant.

Operational Emissions

Operational emission sources consist of mobile emissions and area source emissions. Mobile source emissions estimates are derived from motor vehicle traffic. Area source emissions estimates are derived from the consumption of natural gas, electricity, and consumer products, as well as emissions resulting from landscape maintenance. An estimate of the daily operational missions is derived by combining both mobile and area source emissions. Total daily emissions were estimated for summer, which is the ozone season and, therefore, provide a conservative estimate of emissions.

The operational emissions analysis accounts for the removal of Bishop Ranch 2, which is an existing source of mobile and area source emissions. Table 4.2-11 summarizes existing emissions from Bishop Ranch 2. Where appropriate, these emissions will be subtracted from the proposed project's operational emissions.

Table 4.2-11: Existing Bishop Ranch 2 Emissions

Pollution Source	Emissions (pounds per day)					
	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Area Source Emissions	1	1	3	—	—	—
Mobile Emissions	22	25	262	—	29	6
Emissions Totals (lbs/day)	**23**	**26**	**265**	**—**	**29**	**6**
Source: Michael Brandman Associates, 2007.						

Unmitigated emissions for the proposed project were calculated using the CARB URBEMIS2007 for Windows Version 9.2 model using trip generation rates supplied by the Traffic Operations Evaluation prepared by DMJM Harris. Unmitigated project operational emissions are presented in Table 4.2-12.

Table 4.2-12: Unmitigated Operational Emissions

Pollution Source	Emissions (pounds per day)					
	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Area Source Emissions	38	17	23	>1	>1	>1
Mobile Emissions	287	358	3,625	3	537	103
Emissions Totals (lbs/day)	**326**	**375**	**3,648**	**3**	**537**	**103**
Bishop Ranch 2 Emissions	(23)	(26)	(265)	—	(29)	(6)
Adjusted Emissions (lbs/day)	**303**	**349**	**3,383**	**3**	**508**	**97**
BAAQMD Thresholds	80	80	550	N/A	80	N/A
Exceeds Threshold?	**Yes**	**Yes**	**Yes**		**Yes**	
Source: Michael Brandman Associates, 2007.						

As shown in Table 4.2-12, the proposed project's daily operational emissions would exceed BAAQMD thresholds for ROG, NO_x, CO, and PM_{10}. Therefore, project operational emissions are considered to have a significant impact.

Mitigation is proposed that would require the implementation of operational air pollution control measures. Table 4.2-13 summarizes the mitigated operations-related emissions for the proposed project. As shown in Table 4.2-13, operational emissions would exceed BAAQMD thresholds for ROG, NO_x, CO, and PM_{10} emissions after the implementation of mitigation. Therefore, operational emissions would be a significant unavoidable impact of the proposed project.

Table 4.2-13: Mitigated Operational Emissions

Pollution Source	Mitigated Emissions (pounds per day)					
	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Area Source Emissions	38	14	21	0	>1	>1
Mobile Emissions	218	264	2,679	2	397	76
Emissions Totals (lbs/day)	**256**	**278**	**2,700**	**2**	**397**	**76**
Bishop Ranch 2 Emissions	(23)	(26)	(265)	—	(29)	(6)
Adjusted Emissions (lbs/day)	**233**	**252**	**2,434**	**2**	**368**	**70**
BAAQMD Thresholds	80	80	550	N/A	80	N/A
Exceeds Threshold?	**Yes**	**Yes**	**Yes**		**Yes**	
Source: Michael Brandman Associates, 2007.						

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Construction Emissions

MM AIR-1a During construction activities, the following air pollution control measures shall be implemented:

- The project applicant shall designate an onsite Air Quality Compliance Monitor who shall be responsible for directing compliance with the Best Available Control Measures listed below for fugitive dust mitigation during project construction.
- For any earthmoving that is within 100 feet from any property lines, watering shall be performed as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction. All watering activities shall adhere to the requirements of the proposed project's Storm Water Pollution Prevention Plan.

- For all disturbed surface areas (except completed grading areas), dust suppression shall be applied in a sufficient quantity and frequency to maintain a stabilized surface; any areas which cannot be stabilized, as evidenced by wind-driven dust, must have an application of water at least twice per day to at least 80 percent of the unstabilized area. All watering activities shall adhere to the requirements of the proposed project's Storm Water Pollution Prevention Plan.
- For all disturbed surface areas that are completed grading areas, water shall be applied to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind-driven fugitive dust, excluding any areas that are inaccessible because of excessive slope or other safety conditions. All watering activities shall adhere to the requirements of the proposed project's Storm Water Pollution Prevention Plan.
- For all inactive disturbed surface areas, water shall be applied to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind-driven fugitive dust, excluding any areas that are inaccessible due to excessive slope or other safety conditions. All watering activities shall adhere to the requirements of the proposed project's Storm Water Pollution Prevention Plan.
- For all unpaved roads, vehicle speed shall be limited to 15 miles per hour and water shall be applied at least once a day.
- For all open storage piles, water shall be applied to at least 80 percent of the surface areas of all open storage piles on a daily basis when there is evidence of wind-driven fugitive dust. All watering activities shall adhere to the requirements of the proposed project's Storm Water Pollution Prevention Plan.
- To provide track-out control, chemical stabilization shall be paved or applied at sufficient concentration and frequency to maintain a stabilized surface starting from the point of intersection with the public paved surface, and extending for a centerline distance of at least 100 feet and width of at least 20 feet.
- Rerouting or rapid cleanup of temporary sources of mud and dirt shall be provided on unpaved roads.
- Street sweeping of roads adjacent to the project site shall be done on a regular basis to reduce fugitive dust from traffic.
- During rough grading and construction, an apron shall be built into the project site from the adjoining paved roadways. The apron shall be paved or have a

petroleum-based palliative applied. All petroleum-based palliatives will comply with BAAQMD's Regulation 6, Rule 15.

- During rough grading and construction, streets including shoulders adjacent to the project site shall be swept at least once per day to reduce fugitive dust from traffic, or as required by governing body, to remove silt which may have accumulated from construction activities.
- All diesel-fueled engines used in the construction of the project shall use ultra-low sulfur diesel fuel, which contains no more than 15 ppm of sulfur, or alternative fuels (i.e., reformulated fuels, emulsified fuels, compressed natural gas, or power with electrification). Low-sulfur diesel fuel (500 ppm of sulfur content) shall be used only if evidence is obtained and maintained from the fuel supplier(s) that ultra-low sulfur diesel fuel is infeasible.
- Based on prevailing and generally available technology and to the extent that equipment and technology is cost-effective, the construction contractor shall use catalyst and filtration technologies, and retrofit existing engines in construction equipment
- The construction contractor shall discourage idling of construction equipment and vehicles (or minimize idling time to a maximum of 5 minutes when construction equipment is not in use). The contractor will post temporary signs on the construction site to remind equipment operators to minimize idling time.
- When feasible, emission-intensive phases of construction (e.g., demolition and grading) should occur between November and April, which is outside of the ozone season (May to October).
- In coordination with Mitigation Measure TRANS-9, the project applicant shall develop a Construction Traffic, Staging, and Parking Plan to minimize traffic flow interference from construction activities. The plan may include advance public notice of routing, use of public transportation, and satellite parking areas with a shuttle service. Operations affecting traffic for off-peak hours shall be scheduled. Obstruction of through-traffic lanes shall be minimized. When necessary, a flag person shall be provided to guide traffic properly and ensure safety at construction sites.

Operational Emissions

MM AIR-1b Prior to occupancy of each project component, the project applicant shall demonstrate to the satisfaction of the City of San Ramon that the following operational air quality pollution control measures have been installed (if applicable):

- Install display cases or kiosks in prominent areas that provide transportation information, including ridesharing information, transit schedules, and bicycle route and path information.
- Dock and delivery areas shall include:
  - Signage advising truck drivers to turn off engines when not in use
  - Signage advising truck drivers of State law prohibiting diesel idling of more than five minutes
  - Auxiliary 110 v and 220 v power units so trucks can power refrigeration units or other equipment without idling
- Mechanical ventilation that disperses exhaust efficiently shall be installed in all parking structures in accordance with State standards.
- Surface parking areas shall include clearly marked and shaded pedestrian pathways between transit facilities, adjacent sidewalks, and building entrances.
- Where safety and space constraints do not take precedence, loading and unloading facilities shall be provided near building entrances for transit and carpool/vanpool users with clear visible signage.
- Where practicable and beneficial to the project air quality objectives, cool paving and high-albedo construction materials shall be used for roads, driveways, and other select surfaces to increase reflectivity.
- Low nitrogen oxide-emitting or high-efficiency water heaters shall be installed.
- If the Plaza District residential units include fireplaces, only natural gas fireplaces shall be allowed; conventional open-hearth fireplaces shall not be permitted.
- All heating, ventilation, and air conditioning (HVAC) systems shall include high-efficiency filters for particulates and a carbon filter to remove other chemical matter.

Level of Significance After Mitigation

Significant unavoidable impact.

Carbon Monoxide Hot Spots

Impact AIR-2:	**The proposed project would not create carbon monoxide hot spots that would exceed federal or State concentration standards.**

Impact Analysis

Carbon monoxide from mobile sources is the main pollutant of local concern and correlates to traffic volume, speed, and delay. Carbon monoxide emissions disperse quickly under normal meteorological conditions but can reach unhealthy levels with more stagnant meteorological conditions. High concentrations of CO are often found near signalized intersections or roadway segments operating at LOS E or worse during peak-hour traffic.

The significance of project-related CO impacts is generally based on guidance presented in the CO Protocol prepared by the University of California, Davis, Institute of Transportation Studies. This document presents a series of criteria that are used to determine the significance of impacts. According to the CO Protocol, intersections with LOS E or F require detailed analysis. In addition, intersections that operate under LOS D conditions in areas that experience meteorological conditions favorable to CO accumulation require a detailed analysis.

The Traffic Operations Evaluation prepared for the proposed project (summarized in Section 4.12, Transportation) found that study area intersections are projected to operate at LOS D or better during peak hours after the implementation of mitigation. Because no intersections would operate at LOE E or F, the CO Protocol indicates that there is no potential for the creation of CO hot spots. Therefore, CO hot spot impacts would be less than significant.

Level of Significance Before Mitigation
Less than significant impact.

Mitigation Measures
No mitigation is necessary.

Level of Significance After Mitigation
Less than significant impact.

Cumulative Air Quality Impacts

Impact AIR-3:	**Because operational emissions would exceed regional thresholds, the proposed project would have a significant cumulative impact on air quality.**

Impact Analysis
The BAAQMD CEQA Guidelines indicate that any project that creates a significant individual air quality impact would also have a cumulatively considerable impact on regional air quality. As discussed in Impact AIR-1, the proposed project would result in construction and operational emissions that exceed BAAQMD thresholds and, therefore, result in a significant project-level impact. Mitigation is proposed, but it would not reduce project construction and operation emissions below BAAQMD thresholds. Therefore, project-level emissions would be significant and unavoidable and result in a cumulatively considerable impact on regional air quality.

Level of Significance Before Mitigation
Potentially significant impact.

Mitigation Measures

Refer to Mitigation Measures AIR-1a and AIR-1b.

Level of Significance After Mitigation

Significant unavoidable impact.

Air Quality Management Plan Consistency

Impact AIR-4:	**The proposed project would be inconsistent with the projections contained in the BAAQMD Clean Air Plan.**

Impact Analysis

The BAAQMD Clean Air Plan is the regional air quality management plan for the San Francisco Bay Area. The Clean Air Plan accounts for projections of population growth provided by ABAG and vehicle miles traveled provided by the Metropolitan Transportation Commission, and it identifies strategies to bring regional emissions into compliance with federal and State air quality standards. Because population growth and vehicle miles traveled projections are the bases of the Clean Air Plan's strategies, a project would conflict with the plan if it results in more growth or vehicle miles traveled relative to the plan's projections.

As discussed in the detail in Section 4.10, Population and Housing, the City of San Ramon's 2010 population is anticipated to exceed ABAG's projections by 10.5 percent. With the addition of population growth facilitated by the proposed project, the exceedance is expected to increase to 15.8 percent. In addition, the proposed project would generate a net increase of 24,926 daily vehicle trips, which is a substantial increase above the existing 2,023 vehicle trips generated by Bishop Ranch 2 and the forecasted 3,178 vehicle trips associated with the existing 328,200-square-foot entitlement on Parcel 1A. Therefore, the proposed project would result in increases in population growth and vehicle miles traveled that exceed the assumptions contained in the Clean Air Plan. This is considered a conflict with the regional air quality management plan and is a significant impact for which no mitigation is available to reduce it to a level of less than significant. Therefore, this would be a significant in unavoidable impact of the proposed project.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

No mitigation is available.

Level of Significance After Mitigation

Significant unavoidable impact.

Sensitive Receptors

Impact AIR-5: The proposed project would not expose sensitive receptors to substantial pollutant concentrations.

Impact Analysis

The sensitive receptors of most concern as they relate to the proposed project are the Marriot Residence Inn, the Reflections Condominiums, and Iron Horse Middle School. As discussed in Impact AIR-1, project construction activities would be of temporary duration and would not have the potential to expose sensitive receptors to substantial concentrations of TACs, including DPM. Operational activities associated with the proposed project would result in regular truck deliveries by diesel-powered tractor-trailers. The two anchor stores, the hotel, the cinema, the in-line retail shops, Bishop Ranch 1A, and City Hall would receive regular deliveries or pick-ups from trucks. Generally, deliveries would occur at different times during the day and would not be expected to occur more than 10 times daily for any project use. In addition, State law prohibits the idling of diesel trucks for more than 5 minutes in loading areas. Mitigation Measure AIR-1b includes a provision requiring auxiliary outlets be provided in loading areas so that trucks do not need to idle to power refrigeration units. Because of the distribution of deliveries, the distance between the nearest loading docks and the nearest school-related receptor, and the prohibition on extended idling, operational emissions of diesel particulate matter would not expose sensitive emissions of toxic air pollutants. Impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Objectionable Odors

Impact AIR-6: The proposed project would not generate objectionable odors that would affect a substantial number of people.

Impact Analysis

The proposed project would develop mixed-uses including residential, commercial retail, office, and civic uses in an existing urbanized area. None of these uses would generate substantial odors (e.g., agriculture). Odors may be apparent in and around dumpsters and other refuse collection facilities; however, these facilities would located away from publicly accessible areas (e.g., in loading areas), and odors would localized in a manner that would not affect a substantial number of people. Therefore, potential odor impacts created by the proposed project would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Greenhouse Gas Emissions

Impact AIR-7: Emissions from the proposed project would represent a cumulatively considerable contribution to global greenhouse gas emissions.

Impact Analysis

While neither the CEQA Guidelines nor any judicial decision require an evaluation of a project's emissions of greenhouse gases, consistent with the public policy rationale underlying AB 32, this impact analyzes the significance of the project's greenhouse gas emissions.

Parts of the Earth's atmosphere act as an insulating blanket of just the right thickness, trapping sufficient solar energy to keep the global average temperature in a suitable range. The blanket is a collection of atmospheric gases called greenhouse gases, based on the idea that the gases also trap heat like the glass walls of a greenhouse. These gases—water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone, chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)—all act as effective global insulators, reflecting back to Earth visible light and infrared radiation. Human activities such as producing electricity and driving vehicles have elevated the concentration of these gases in the atmosphere. Many scientists believe that these, in turn, are causing the Earth's temperature to rise, although other scientists disagree. A warmer Earth may lead to changes in rainfall patterns, much smaller polar ice caps, a rise in sea level, and a wide range of impacts on plants, wildlife, and humans.

Project-Specific Impacts

An individual project cannot generate enough greenhouse gas emissions to significantly influence global climate change. The project participates in this potential impact by its incremental contribution combined with the cumulative increase of all other sources of greenhouse gases, which when taken together form global climate change impacts.

Cumulative Impacts

The following discussion reviews the project's potential generation of greenhouse gases and its incremental contribution to the cumulative effect of the greenhouse gases. A two-tiered approach is used: (1) project inventory of greenhouse gas emissions and (2) project compliance with the emission reduction strategies contained in the California Climate Action Team's Report to the Governor.

Greenhouse Gas Inventory

The emissions are estimated in tons per year, which are converted to teragrams of carbon dioxide equivalents (Tg CO_2 Eq.) using the formula Tg CO_2 Eq. = (tons of gas) ÷ 1.12 (metric tons per ton) × (GWP) × (1,000,000). One Tg is equal to one million metric tons, and one metric ton is equal to 2.24 tons.

Note that emissions models such as EMFAC and URBEMIS evaluate aggregate emissions and do not demonstrate, with respect to a global impact, how much of these emissions are "new" emissions specifically attributable to the proposed project. For most projects, the main contribution of greenhouse gas emissions is from motor vehicles, but how much of those emissions are "new" is uncertain. New projects do not create new drivers. Some mixed use and transportation-oriented projects can actually reduce the number of vehicle miles traveled that a person drives by eliminating the need to drive and by clustering housing, employment, retail, and entertainment uses in one destination. Therefore, it is anticipated that the project itself will not substantially add to the global inventory of greenhouse gas emissions. Nevertheless, greenhouse gas emissions are estimated using procedures similar to those for criteria pollutants.

Carbon Dioxide: The project would generate emissions of carbon dioxide primarily in the form of vehicle exhaust and in the consumption of natural gas for heating from onsite combustion. Carbon dioxide emissions from vehicles were calculated using URBEMIS2007 Version 9.2 assumptions and EMFAC2007 emission factors. Carbon dioxide emissions from natural gas combustion were estimated from guidance as presented in the Climate Leaders Greenhouse Inventory Protocol. The carbon dioxide emissions are shown in Table 4.2-14, which illustrates that at buildout, the project will emit 3.99E-02 Tg CO_2 Eq.

Table 4.2-14: Project Carbon Dioxide Emissions

Emission Source	Carbon Dioxide Emissions
	2010
Vehicles (lbs/day)	224,499
Natural gas combustion (lbs/day)	16,435
Total (metric tons per year)	39,890
Total (Tg CO_2 Eq.)	3.99E-02
Source: Michael Brandman Associates, 2007.	

Methane: The project would generate some methane gas from vehicle emissions and natural gas combustion. Methane emissions projections from natural gas combustion were generated using guidance as presented in the Climate Leaders Greenhouse Inventory Protocol. Methane emissions from vehicles were estimated using EPA emission factors for on-highway vehicles, and the same assumptions used to estimate criteria pollutants in URBEMIS2007. The emissions are shown in Table 4.2-15, which illustrates that in 2008, emissions would be 3.29E-04 Tg CO_2 Eq.

Table 4.2-15: Project Methane Emissions

Emission Source	Methane Emissions
	2010
Vehicles (lbs/day)	93.41
Natural gas combustion (lbs/day)	1.14
Total (metric tons/year)	15.65
Total (Tg CO_2 Eq.)	3.29E-04
Source: Michael Brandman Associates, 2007.	

Nitrous Oxide: The project would generate small amounts of nitrous oxide from vehicle emissions. Emissions from natural gas combustion were estimated using guidance as presented in the Climate Leaders Greenhouse Inventory Protocol. Nitrous oxide from vehicles was estimated using EPA emission factors for on-highway vehicles, and the same assumptions that were used to estimate criteria pollutants. The emissions are presented in Table 4.2-16, which illustrates that in 2008, emissions would be 2.36E-03 Tg CO_2 Eq.

Table 4.2-16: Project Nitrous Oxide Emissions

Emission Source	Nitrous Oxide Emissions
	2010
Vehicles (lbs/day)	45.91
Natural gas combustion (lbs/day)	2.28E-02
Total (tons/year)	7.60
Total (Tg CO_2 Eq.)	2.36E-03
Source: Michael Brandman Associates, 2007.	

Water Vapor: The project does not contribute to this greenhouse gas because water vapor concentrations in the upper atmosphere are primarily due to climate feedbacks and not emissions from industrial and commercial activities.

Ozone is a greenhouse gas; however, unlike the other greenhouse gases, ozone in the troposphere is relatively short-lived and, therefore, is not global in nature. According to CARB, it is difficult to make an accurate determination of the contribution of ozone precursors (NO_x and VOC) to global warming.

Chlorofluorocarbons: CFCs have no natural source, but were first synthesized in 1928. They were used for refrigerants, aerosol propellants, and cleaning solvents. Because of the discovery that they are able to destroy stratospheric ozone, a global effort to halt their production was undertaken and was extremely successful—so much so that levels of the major CFCs are now remaining level or declining. Because of the ban on chlorofluorocarbons, it is assumed that the project will not generate a significant amount of emissions of these greenhouse gases, which are not considered any further in this analysis.

In addition, the San Ramon City Code, Division B6, Chapter III, sets strict standards for chlorofluorocarbon-processed food packaging operations and repackaging prohibitions that will also help neutralize any potential increases that may occur.

Hydrofluorocarbons: The project may emit a small amount of HFC emissions from leakage and service of refrigeration and air conditioning equipment and from disposal at the end of the life of the equipment. However, the details regarding the refrigerant used and the capacity are unknown at this time.

Perfluorocarbons and sulfur hexafluoride are typically used in industrial applications, none of which would be used by the project. Therefore, it is not anticipated that the project would emit any of these greenhouse gases.

Inventory Summary: The primary greenhouse gas generated by the project would be carbon dioxide. At buildout, total unmitigated carbon dioxide equivalents would be 4.26E-02 Tg CO_2 Eq., which is 0.00865 percent of California's 2004 emissions (492 Tg CO_2 Eq.) and 0.0502 percent of the Bay Area's 2002 emissions.

Global warming has been recognized as a viable threat to life on earth. The potential health effects from global climate change may be from temperature increases, climate-sensitive diseases, extreme events, and air quality. There may be direct temperature effects through increases in average temperature leading to more extreme heat waves and fewer extreme cold spells. Those living in warmer climates are likely to experience more stress and heat-related problems. Heat-related problems include heat rash and heat stroke. In addition, climate-sensitive diseases may increase, such as those spread by mosquitoes and other disease-carrying insects, including malaria, dengue fever, yellow fever, and encephalitis. Extreme events such as flooding and hurricanes can displace people and agriculture, which would have negative human health consequences that include the spreading of disease and death. Global warming may also contribute to air quality problems from increased amounts of smog and particulate air pollution.

It is often the case that mitigations for greenhouse gases are also beneficial to local criteria air pollution reductions. Many greenhouse gas mitigations increase energy efficiency, which would reduce criteria pollutants as well. Several mitigation measures would directly or indirectly contribute to reductions in greenhouse gas emissions. These are listed below:

- **MM AIR-1b:** Requires measures to reduce operational emissions, including display cases or kiosks in prominent areas that provide transportation information; auxiliary power units in dock and delivery areas for trucks to power refrigeration units without idling; clearly marked and shaded pedestrian pathways between transit facilities; adjacent sidewalks and building entrances; use of cool paving and high-albedo construction materials in roads, driveways, and other paved surfaces to increase reflectivity; use of low nitrogen oxide-emitting or high-efficiency water heaters; and a prohibition on conventional open-hearth fireplaces.

- **MM TRANS-8:** Requires that bicycle storage facilities be provided near the entrances of project buildings.
- **MM US-1a:** Requires that recycled water be used for outdoor irrigation.
- **MM US-1b:** Requires project landscaping to comply with the Model Water Efficient Landscape Ordinance.
- **MM US-1c:** Requires the use of water efficiency measures, including high-efficiency clothes washers and dishwashers, re-circulating hot water systems, high-efficiency or tankless water heaters, green roofs, evapotranspiration-based irrigation controllers, water budgets for landscape irrigation, and high-efficiency toilets in non-residential buildings.
- **MM US-5:** Requires energy efficiency measures, such as natural day lighting through the use of windows and skylights; automated occupancy sensors in structures that automatically shut off lights when rooms are unoccupied; and participation in PG&E energy efficiency rebate programs (e.g., air conditioning, gas heating, refrigeration, and lighting, high-efficiency clothes washers and dishwashing machines, re-circulating hot water systems, and tankless water heaters).

In addition to the measures listed above, additional mitigations are proposed for the proposed project to help serve the dual purpose of reducing criteria and greenhouse gas emissions.

Compliance with Greenhouse Gas Emissions Reduction Strategies

Mitigation of global warming impacts is based on the project's consistency with the strategies proposed in California Environmental Protection Agency Climate Action Team's report. If the project is consistent with those strategies that the Lead Agency deems feasible, then a project could be deemed to have a less than significant impact on global climate change.

The Climate Action Team Report to Governor Arnold Schwarzenegger and the Legislature proposes a path to achieve the Governor's targets that will build on voluntary actions of California businesses, local government and community actions, and State incentive and regulatory programs. The report introduces strategies to reduce California's emissions to the levels proposed in Executive Order S-3-05. This is the best information available at this time; it is unknown when and what will be published in the future.

Table 4.2-17 contains the Climate Action Team strategies that apply to the project. As shown in the table, the project is consistent with all feasible and applicable measures to bring California to the emission reduction targets.

Table 4.2-17: Greenhouse Gas Emission Reduction Strategy Consistency Analysis

Agency	Greenhouse Gas Emission Reduction Strategy	Consistency Analysis
California Air Resources Board (CARB)	Vehicle Climate Change Standards AB 1493 required the State to develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of climate change emissions emitted by passenger vehicles and light-duty trucks. Regulations were adopted by CARB in September 2004.	**Consistent**: The vehicles that access the project will be in compliance with any vehicle standards that CARB proposes.
	Diesel Anti-Idling In July 2004, the CARB adopted a measure to limit diesel-fueled commercial motor vehicle idling.	**Consistent**: Mitigation AIR-1b includes provisions intended to prevent idling in loading dock areas.
	Hydrofluorocarbon Reduction (1) Ban retail sale of HFC in small cans; (2) require that only low GWP refrigerants be used in new vehicular systems; (3) adopt specifications for new commercial refrigeration; (4) add refrigerant leak-tightness to the pass criteria for vehicular inspection and maintenance programs; (5) enforce federal ban on releasing HFCs.	**Consistent**: This measure applies to consumer products. When CARB adopts regulations for these reduction measures, any products that the regulations apply to will comply with the measures.
	Transportation Refrigeration Units (TRUs), Off-Road Electrification, Port Electrification Strategies to reduce emissions from TRUs, increase off-road electrification, and increase use of shore-side/port electrification.	**Consistent**: The project may have TRUs visiting the project site. Mitigation AIR-1b requires that auxiliary power units be provided in loading areas to power TRUs and prevent idling.
	Heavy-Duty Vehicle Emission Reduction Measures Increased efficiency in the design of heavy-duty vehicles and an education program for the heavy-duty vehicle sector.	**Consistent**: These are CARB-enforced standards; vehicles that access the project that are required to comply with the standards will comply with the strategy.
	Achieve 50% Statewide Recycling Goal Achieving the State's 50 percent waste diversion mandate as established by the Integrated Waste Management Act of 1989 (AB 939, Sher, Chapter 1095, Statutes of 1989) will reduce climate change emissions associated with energy-intensive material extraction and production as well as methane emission from landfills. A diversion rate of 48% has been achieved on a statewide basis. Therefore, a 2% additional reduction is needed.	**Consistent**: Mitigation Measures US-4a and US-4b require the proposed project to implement recycling and waste diversion measures during the construction and operation phases, respectively.